NETWORK WORLD
The Newsweekly of Enterprise Network Strategies
Volume 9, Number 27 An International Data Group Publication July 6, 1992

SFT III option readied for NetWare 4.0

By Margie Wylie
Senior Editor

PROVO, Utah — Like a mirage in the desert, Novell, Inc.'s NetWare SFT III is beginning to shimmer and materialize again just over the next dune, NetWare 4.0.

Novell is preparing to beta-test the server mirroring software later this summer and plans to release the completed product for NetWare 4.0 six months after it ships the new net operating system late this year, said Bob Young, director of marketing for Novell's NetWare Products Division.

System Fault Tolerance Level III, which Novell announced more than two years ago, is a series of NetWare Loadable Modules designed to endow microcomputer-based NetWare local-area networks with the fault tolerance associated with minicomputers and mainframes.

It works by duplicating every server transaction on two servers. If the primary server fails, the network switches to the secondary server without interrupting net services.

(continued on page 49)

NETLINE

▲▲▲

NIST TO UNVEIL more secure version of its digital signature standard. Page 2.

'SON OF NREN' BILL proposes more than $1 billion for new net technologies. Page 2.

NAP NETVIEW/PC application extends its reach to SNMP agents. Page 2.

PACER'S DAL SERVER gives Macintosh clients access to popular databases on RS/6000s. Page 6.

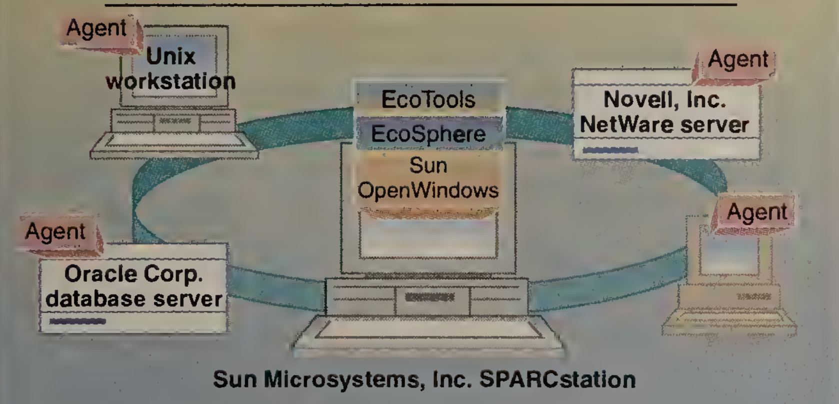
LEGENT TO HELP IBM pump up SystemView. Page 6.

DEADBEAT DADS will dread new California net. Page 6.

HOUSE MOVES CLOSER to letting RBHCs manufacture equipment. Page 10.

NEWSPAPER

Getting control over client/server nets


Agent
Unix workstation
EcoTools
EcoSphere
Sun OpenWindows
Agent
Novell, Inc. NetWare server
Agent
Oracle Corp. database server
Agent
Sun Microsystems, Inc. SPARCstation

EcoSystems Software's EcoSphere provides performance, fault and configuration management for devices, networks and applications in a client/server environment. EcoTools are management applications tuned for specific products, such as an Oracle database.

GRAPHIC BY SUSAN SLATER SOURCE: ECOSYSTEMS SOFTWARE, INC.

Packet forwarding not the only measure of routers

By Maureen Molloy
Senior Writer

Although many vendors still tout packet-forwarding rates as the key criterion for judging bridge/router performance, the growing sophistication of the devices demands a more in-depth analysis.

In addition to packet-forwarding speed, users need to determine aggregrate throughput and latency rates, according to Kevin Tolly, president of Interlab, a network testing and consulting firm in Sea Girt, N.J.

Combined, the three metrics will provide a truer assessment of how bridge/routers will operate in production networks. Placing too much emphasis on packet-processing performance can lead users to a box that is ill-suited to their needs.

"For too long, packets per second has been the only performance standard discussed. Defining a bridge's or router's performance using unreasonably small packet sizes is meaningless," Tolly said.

(continued on page 49)

ABA offers model plan for electronic payment partners

By Ellen Messmer
Washington Correspondent

CHICAGO — A division of the American Bar Association (ABA) has readied a model trading partner agreement to help companies doing business together define the terms and conditions for electronic payments.

The Model Electronic Payments Agreement and Commentary (for Domestic Credit Transfers) is the result of a two-year effort by the ABA's Electronic Data Interchange and Information Technology Division to create a prototype that defines trading partners' rights and responsibilities in the electronic funds transfer process.

"It deals with a set of issues that have not been widely explored," said Michael Baum, a principal with Independent Monitoring, Inc. in Cambridge, Mass.

Baum worked with other ABA members and businesses to create the model electronic payments agreement.

In general, trading partner agreements define the relationship between two companies that use EDI for orders, invoices, billing and freight forwarding.

Trading partner agreements typically define which EDI transaction sets will be used between the partners or when an EDI message is considered to have been received.

Baum said that while EDI trad-

(continued on page 49)

New software targets client/server mgmt.

Start-up demonstrates centralized platform for managing devices, applications and databases.

By Wayne Eckerson
Senior Editor

BOSTON — Start-up EcoSystems Software, Inc. last week offered users their first look at soon-to-be-announced software that promises to manage computers, networks, applications and databases in a client/server environment.

Called EcoSphere, the software will enable an administrator to monitor and control a wide array of elements in a client/server network, freeing up database and systems administrators, as well as other technology experts, to focus on more productive activities, company officials said.

EcoSphere runs on a Sun Microsystems, Inc. SPARCstation, which serves as a central management station, and supports EcoSystems and third-party element management applications.

EcoSphere communicates in real time with remote agents that monitor software and hardware and trigger actions to resolve problems.

"Comprehensive systems management utilities developed for mainframe computing have not been extended to client/server platforms," said Mike Fung, president and chief executive officer of EcoSystems. "Our mission is to create a logical glasshouse for all levels of management involved in client/ser-

(continued on page 48)

INSIDE FEATURES

- Apple, IBM mark alliance anniversary, but users are waiting for the gifts. Page 36.
- Innovator John Nagata links L.A.'s schools on a shoestring budget. Page 51.

AT&T gives call centers SDN routing

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week enhanced a key 800 routing feature to enable users to automatically reroute traffic among call centers using Software-Defined Network connections rather than private lines.

The extension of the Look Ahead Interflow feature, which previously had been available only to users with private networks, promises savings for companies with light to moderate traffic among call centers. Look Ahead Interflow, which requires Integrated Services Digital Network Primary Rate Interface (PRI) access, enables users to treat multiple call centers as a single virtual center by automati-

(continued on page 10)

New NIST digital signature encryption standard to bow

In response to concerns about security, the new and improved version will be tougher to crack.

By Ellen Messmer
Washington Correspondent

GAITHERSBURG, Md. — In response to public criticism that its proposed encryption standard for digital signatures is too easy to crack, the National Institute of Standards and Technology (NIST) plans to release a new version.

NIST officials told *Network World* the key size proposed in the Digital Signature Standard (DSS) will be longer than currently specified and, thus, the entire encryption scheme will be harder to break. NIST will release the modified version at the beginning of August, allowing another round of public comment before issuing DSS as a government standard and a federal purchasing requirement.

Digital signature encryption is used in electronic document exchange as a means of verifying the sender of the document and assuring that the document has not been tampered with. A digital signature algorithm scheme does not encrypt the document but is used by the sender to place on the record an electronic seal, which can be unscrambled by the receiver to reveal the sender's

(continued on page 48)

'Son of NREN' bill proposes to create digital libraries

Bill's aim is a nationwide communications system.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Sen. Albert Gore (D-Tenn.) last week introduced a broad-based technology bill that would fund the creation of digital libraries and give more schools access to the Internet.

The bill, The Information Infrastructure and Technology Act of 1992, proposes giving four federal agencies a total of $1.15 billion over five years to develop network technologies for use in education, medicine, manufacturing and other areas. The long-term goal of the bill is to create a nationwide communications system that would give any user access to a wide variety of databases and other services.

Gore's proposed legislation, which echoes many ideas contained in his gigabit-speed National Research and Education Network (NREN) bill passed last year, is already being dubbed "son of NREN" on Capitol Hill.

The bill would hand over a total of $300 million to the National Science Foundation (NSF), the National Aeronautics and Space Administration and the Defense Advanced Research Projects

(continued on page 49)

NetView/PC vendor unveils distributed TCP/IP pack

By Michael Cooney
Senior Editor

SAN JUAN CAPISTRANO, Calif. — Automated Network Management, Inc. last week announced an enhancement that enables its NetView/PC application to collect SNMP management data and feed it to enterprise-level management systems.

The company, based here, announced new Simple Network Management Protocol software that works with its existing Network management Access Program (NAP) to collect SNMP data and forward it to IBM's NetView, Systems Center, Inc.'s Net/Master or AT&T's Accumaster Integrator management systems. The software can also pass commands from those systems to control remote devices using SNMP.

NAP is a NetView/PC application that lets non-Systems Network Architecture devices pass alerts and alarms to NetView or Net/Master. The new SNMP software includes a driver that enables NAP to support the Integrator.

Multiple OS/2 machines running the SNMP/NAP software can be distributed throughout a Transmission Control Protocol/

(continued on page 49)

Briefs

Say 'cheese!' The Open Software Foundation, Inc. (OSF) last week released its first "snapshot" of the Distributed Management Environment (DME), offering developers a peek into what the management framework will look like when it is released late next year. One thing that will not be included in the framework's initial release is IBM's data engine object server, which was passed over, at least for now, to ease development of the framework ("OSF scraps plans to use IBM data engine in its DME," *NW,* June 15). The specifications should help vendors gradually incorporate DME into their products.

Banyan goes public. As expected, local network-provider Banyan Systems, Inc. last week went public. The company filed for an initial public offering of 2,670,000 shares of its common stock, with an estimated price range of $10 to $12 per share.

AT&T settles with workers. AT&T and its two largest labor unions have agreed on a tentative three-year contract, which involves an 11.1% wage increase for workers over the life of the contract and a 13% average hike in pension benefits. The pact was completed with help from federal mediators. During the months of negotiations, the 125,000 employees represented by the Communications Workers of America and the International Brotherhood of Electrical Workers worked under the old contract, which expired May 30.

Bandwidth-on-demand. AT&T Paradyne last week said it will begin selling inverse multiplexers this fall. The company's Acculink Bandwidth Controller is the result of a joint development arrangement reached earlier this year with Ascend Communications, Inc. of San Francisco. Prices for the Acculink Bandwidth Controller will range from $7,000 to $16,000. Meanwhile, AT&T Paradyne said it will also sell bridge/routers manufactured by Cisco Systems, Inc. in Menlo Park, Calif.

Help desk autodialer. IBM next week will introduce a SystemView help desk service that will support automatic dial-in to IBM's customer support center to order service, parts and assistance, analysts said. The new service will also help users obtain information on the status of service requests, as well as new net or software products.

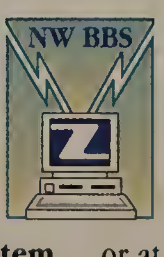
BONDING shows off. Last week's Intelemart show in Washington, D.C. was the site of the first inverse multiplexer interoperability demonstration. Through the use of a common specification recently deployed in their products, Ascend Communications, Inc., Digital Access Corp., PictureTel Corp. and Promptus Communications, Inc. conducted a multipoint videoconference using six switched 56K bit/sec AT&T and MCI Communications Corp. links hubbed through a PictureTel M8000 Bridge in Danvers, Mass. The inverse multiplexer specification from the Bandwidth on Demand Interoperability Group is expected to be finalized as a standard this month.

Noncompetitive? At a Senate hearing last week on competition in the cellular industry, the General Accounting Office (GAO) said the system of two providers per market set up by the Federal Communications Commission has failed to produce price competition. Kenneth Mead, GAO director of the resources, community and economic development division, criticized the FCC for not performing a market evaluation to examine the effect of its policy.

CONTACTS

▲▲▲

We want to hear from you. *Network World* has set up a toll-free number you can use to leave news tips or letters to the editor. Let us know what's going on or how you feel about the stories you read in our publication by calling (800) 622-1108, Ext. 487.



NW Bulletin Board System. Contact us electronically. Our BBS lets you submit letters to the editor, pass on tips, leave change of address requests, interact with other readers, download free software and hunt for jobs. You can use your IBM, Apple or other microcomputer to reach the BBS at 300 to 2,400 bit/sec (8N1) by dialing (508) 620-1160 or at speeds up to 9.6K bit/sec by dialing (508) 620-1178.

CONTENTS

Data Net Architectures 9
APPC/MVS fighting for industry respect.
Sprint to provide services for DARPA research net.

Local Networking 15
Everex brings fault tolerance to NetWare.
Intel intros bevy of SNMP, NetWare LAN mgmt. wares.

Internetworks 19
Dial-up links finding new role in internets.
Penril fills out low end of its Ethernet bridge line.

Global Services 21
Users, carriers clash over quality issue.
New Swiss law forces PTT to share CPE, data markets.

Enterprise Applications 25
Development system supports many GUIs.
Ingres to integrate DBMS with high-end applications.

Industry Update 29
BT offers complete videoconferencing.
Vendors unite to back PPP router-to-router protocol.

Management Strategies 31
Survey shows users not using fax to full potential.
Work flow applications simplify office processes.

Opinions 34

Features 36

Action Center 40

Networking Marketplace 46

REPRINTS

Article and chart reprints (minimum 500 copies) can be ordered from Donna Kirkey, Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172; (508) 875-6400.

Back issues ($5 per issue) can be ordered from Bobbie Cruise by calling (800) 622-1108.

TORCHED BY TOKEN RING ?

ODS CAN IMPROVE YOUR BOTTOM LINE !

How much productivity is lost each time your company experiences a Token Ring network failure? How many valuable man hours are expended on locating and correcting Token Ring network problems?

ODS intelligent Token Ring hubs can dramatically increase your Token Ring network uptime and decrease the intensive manpower effort involved in locating and correcting Token Ring failures. This break-through in Token Ring technology can practically end network outages.

9 SECOND RECOVERY TIME

In less than **9 SECONDS*** ODS intelligent Token Ring hubs can locate the problem which has caused your network failure, disconnect the problem from your network, report the location of the problem and have your network restored. This network recovery is so fast that most Token Ring applications will never detect that a problem occurred. ODS intelligent Token Ring products can achieve all this without human intervention.

TO GOOD TO BE TRUE ?

Sometimes it is hard to judge the effects of such technological advancements until you see it's dramatic effect on productivity. Once you see how quickly and easily ODS Token Ring products can improve your bottom line, you can judge the results for yourself.

PROVE IT !

ODS welcomes the opportunity to demonstrate this dramatic advancement in Token Ring networking to you and your company.

CALL US FOR A FREE DEMONSTRATION

* Testing has shown that in 95 % of cases error recovery was achieved in 9 seconds or less. In the remaining 5 % the hub with the problem port attached to it was isolated from the network in 9 seconds or less, then error recovery on the intelligent hub to which the problem device was attached took ((30 * number of inserted lobes on that hub)/2) seconds on the average to achieve error recovery and rejoin the Token Ring network.

ODS

OPTICAL DATA SYSTEMS

Optical Data Systems, Inc.
USA & Canada (214) 234-6400
International + 49 89 319.5039

Circle Reader Service #113

Because BIGG

Introducing the AT&T MEGACOM® FAMILY OF SERVICES

If you're a bigger company, one that spends between $3,000 and $30,000 a month on long distance, AT&T now offers a unique and exciting choice of services: the AT&T Megacom Family of Services.

Megacom Plus* Service and Megacom Optimum Service are the *newest* members of the family for single- or multi-location businesses. Like Megacom Service, and Megacom 800 Service, they can give you all the reliability, service, and flexibility you need—at very competitive prices.

If you're a bigger business, take a minute to find out which Megacom service meets your needs best. Sign up before 10/15/92 and you'll receive ***free installation.*****

AT&T MEGACOM PLUS SERVICE

A new outbound service, with additional savings and a choice of features, intended especially for companies with multiple locations of all sizes.

- Combine calls from all your locations, including domestic, AT&T Calling Card, international and USA Direct® calls, into one bill—available in a choice of billing formats: PC disk, magnetic tape, or hard copy.
- Spot trends and identify potential calling fraud with the optional PC billing package. Select from 56 standard reports or customize your own.
- Features the advanced maintenance service option, MegaWatch,℠ which proactively monitors your service and equipment to help keep your business up and running.
- Volume and term plan discounts available for even greater savings.

More choices for bigger businesses. Because one size does not fit all.

© 1992 AT&T *Pending FCC approval. **Installation must be made by 12/31/92.

ER

comes in many sizes.

for businesses spending between $3,000 and $30,000 a month on long distance.

AT&T MEGACOM OPTIMUM SERVICE

For single- or multiple-location businesses, this new service is the "gold standard," offering all the features included in Megacom Plus Service, and more, with the highest level of outbound service and support available from AT&T.

- Features a dedicated 24-hour customer support center to handle your long distance operation, installation, and maintenance.
- Includes the standard PC billing package. Choose your own bill format, even CD ROM, to give you incredible flexibility.
- Choice of 20 different billing dates. Choose the one that best fits your company's cash flow.
- Includes state-of-the-art monitoring to help spot problems before they interfere with your calling.
- Choice of two domestic rate structures: single postalized rates or 3-tier mileage rate structure.

AT&T MEGACOM SERVICE

- Offers single-location companies essential features: AT&T quality and reliability at competitive prices.
- Opportunity to add on powerful options, such as MegaWatch, the 24-hour proactive maintenance service.

AT&T MEGACOM 800 SERVICE

- Guaranteed emergency backup service in 30 minutes or less if service is ever interrupted.
- Advanced routing features help you complete more calls.

INTERNATIONAL FEATURES

- Available with any Megacom service—gives you the clearest connections to over 200 countries and areas around the world.
- Includes the exclusive AT&T Language Line® Services, which give you an on-line interpreter in 140 languages.

Call 1 800 858-MEGA, ext 39.

AT&T
The right choice.

DAL server connects Macs to IBM RS/6000 databases

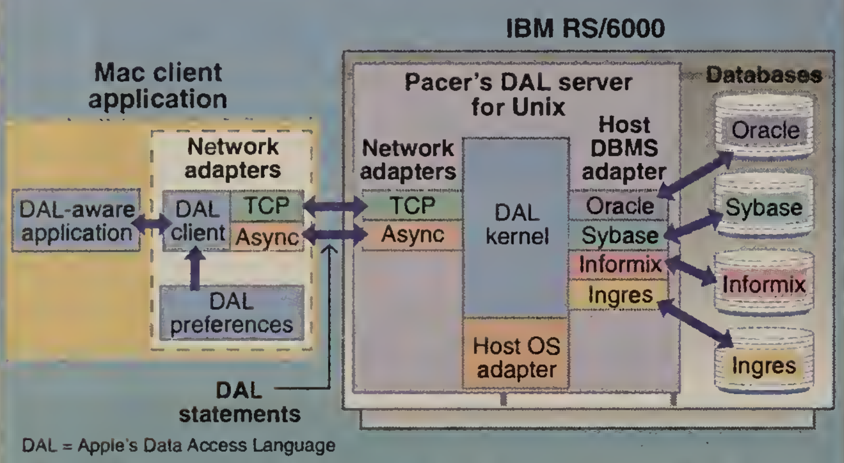
By Caryn Gillooly
Senior Editor

SANTA CLARA, Calif. — Pacer Software, Inc. next week is expected to bring out a product that will let Apple Computer, Inc. Macintosh users transparently access databases on IBM RISC System/6000 machines.

To be announced at the Mactivity '92 show here, DAL Server for AIX is a hardware/software implementation of Apple's Data Access Language (DAL), an Apple-specific database language supported in the Macintosh's System 7 operating system that provides links to a variety of relational databases.

DAL Server for AIX consists of software and adapter cards for an AIX-based RS/6000 supporting Informix Software, Inc., Ingres, Oracle Corp. and Sybase, Inc. database management systems. The product enables an end user to make direct calls from a Macintosh to the RS/6000 databases.

Pacer serves up database access for Macs



Using Pacer's DAL Server for AIX, an Apple Computer, Inc. Macintosh client can forge a direct connection from a Mac application to a variety of relational databases on an IBM RISC System/6000.

GRAPHIC BY SUSAN SLATER

SOURCE: PACER SOFTWARE, INC., LA JOLLA, CALIF.

Pacer offers DAL servers for Hewlett-Packard Co.'s HP9000 and Sun Microsystems, Inc.'s SPARCstations, enabling Macintosh users to connect to databases that reside in these environments as well.

Without the DAL server for AIX, a Macintosh user must buy a terminal-emulation package to connect to an RS/6000, then rely on an SQL engine to translate database requests.

"This basically serves as both a terminal emulator and an SQL engine," said Paul Kamp, director of server marketing at Pacer, based in La Jolla, Calif.

Kamp also pointed out that, without the DAL server, users must exit their applications to access the database. However, with DAL, users will be able to pull data from within any of the 28 applications that currently support DAL.

"This will let you reach into the database and incorporate that data directly into a spreadsheet," he said.

DAL for AIX is currently in field tests and is expected to be available Aug. 1. Pricing will range from $4,000 for a 16-simultaneous-user license to $12,000 for an unlimited-user license. Each license includes access support for Informix, Ingres, Oracle and Sybase databases, as well as Transmission Control Protocol/Internet Protocol and asynchronous net adapters. ◻

N.Y. legislature passes bill to make toll fraud a felony

Once signed by Gov. Mario Cuomo, law will give police and prosecutors a tool with some teeth.

By Anita Taff
Washington Bureau Chief

ALBANY, N.Y. — State lawmakers here last week gave police a major tool to use in combatting toll fraud by passing a bill making the crime a felony.

The bill received overwhelming support in the New York State Assembly and Senate, with only one negative vote. It is expected to be quickly signed into law by New York Gov. Mario Cuomo.

Prior to the passage of the bill, toll fraud thefts, no matter how large, were considered misdemeanors in New York. Now, any toll fraud theft of more than $1,000 is a felony, punishable by up to three years in jail.

Sprint Corp. praised the state's effort. "New York police and prosecutors finally have a law with real teeth in it that will let them go after [toll fraud criminals]."

Henry Levine, a telecommunications attorney who represents a number of large corporate users, was less enthusiastic. "The New York law is fine, but it's exactly like increasing the penalties for using a gun to commit a crime rather than having gun control."

He said that rather than increasing legal penalties, more help is needed from carriers in preventing toll fraud in the first place.

Industry experts estimate that each year businesses lose between $1 billion and $4 billion due to toll fraud. At least $500 million of those thefts are believed to stem from criminals operating in New York, according to Tom Collins, communications director for state Sen. Dale Volker (D-Brooklyn), a cosponsor of the bill.

Toll fraud typically involves hackers who use pilfered private branch exchange calling codes to dial through corporate PBXs to locations all over the world. Thieves are also able, in some cases, to trick voice mail systems into giving them an outside line to place international calls.

New York's new toll fraud law may help reduce the crime in several ways. First, it enables police to arrest and prosecute criminals who have in their possession any type of access device or authorization code used to unlawfully obtain telephone service. Previously, mere possession of a stolen PBX code or calling card code was not enough for an arrest.

Also, by raising penalties, the law makes toll fraud less attractive to thieves and it may make such cases more likely candidates for police attention.

Currently, only six other states categorize toll fraud as a felony. ◻

Correction: Due to an editing error, the story "New NetWare sparks confusion for users" (*NW*, June 29) incorrectly stated that Novell, Inc. is selling NetWare Version 2.X at twice the price of Version 3.X. The story should have stated that Novell is selling nearly twice as many copies of the lower priced 2.X compared to 3.X.

California network takes aim at deadbeat parents

Vendors team up on state automation project.

By Skip MacAskill
Staff Writer

SACRAMENTO, Calif. — Continuing a nationwide trend aimed at cracking down on parents delinquent in their child support payments, California is building a network designed to help locate these scofflaws.

The state last week selected Lockheed Information Management Services Co. (IMS) to develop a net — dubbed the Statewide Automated Child Support System — that is expected to increase child support collections by more than $135 million a year.

The project aims to recoup over $3 billion in outstanding child support payments in California and was driven by a federal mandate requiring all states to computerize their child support services by year-end 1995.

"Absent parents who owe child support will not be able to move from county to county and drop out of the system," said Kathleen Norris, director of public affairs for California's Department of Social Services (DSS). "The new network is not only going to interlink the counties, but also substantially streamline the counties' operations."

The new net will use Digital Equipment Corp.'s DECnet architecture to link minicomputers in all but one of California's 58 counties. It will be tied to a similar network in Los Angeles County as well as the nationwide Child Support Enforcement Network that connects child support offices in the U.S., Puerto Rico and

(continued on page 50)

Legent signs on to IBM's SystemView

By Michael Cooney
Senior Editor

VIENNA, Va. — In a move to strengthen its SystemView strategy, IBM last week enlisted the support of Legent Corp., one of the industry's largest vendors of automated network and systems management tools.

Legent has signed on to IBM's SystemView Development Program, which means it will take part in the planning and technical development of future SystemView products. In addition, the company's product line will conform to SystemView standards for systems management. The agreement does not provide for cross-marketing of products.

SystemView, a network and systems management blueprint intended to give users a set of compatible management products from IBM and others, has been accused of being long on vision and short on products. The Legent signing may help dispel that perception by adding some powerful and popular products.

For example, Legent announced that five members of its current product line — AutoMate, AutoMate/XC, Endevor, Endevor/OS/2 and OptiModel — now comply with SystemView's graphical user interface.

The AutoMate products let users automate operations such as net start-up and the gathering of performance reports. Endevor products automate mainframe software management tasks, while OptiModel is software that lets users evaluate potential network and host changes.

(continued on page 50)

Get in touch with the R.A.F.

The Reader Advocacy Force (R.A.F.) tackles the tough issues facing our readers — the buyers of network products and services. As consumer advocates, we want to hear about any problems you've encountered with products, service and support, or interoperability of equipment, as well as any other concerns you have.

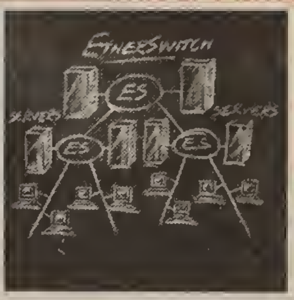
NETWORK WORLD'S R.A.F. READER ADVOCACY FORCE

We'll investigate your tip and, if we write about it, we'll send you a T-shirt emblazoned with the *Network World* R.A.F. logo.

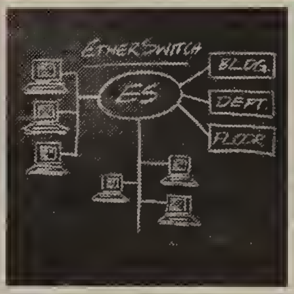
You can contact us via the R.A.F. hot line at (800) 622-1108, Ext. 487 or through the R.A.F. Forum on our electronic Bulletin Board System (BBS). For instructions on using the BBS, see page 2.

The absolutely incredible story of how George Gilbert went from ordinary network manager to network god overnight…

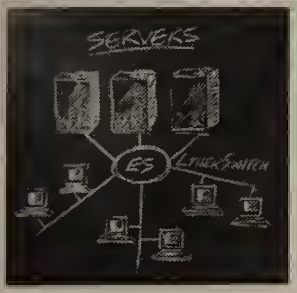
…and he did it without **FDDI!** For George Gilbert (not his real name), yesterday began just like any other day for any other hardworking network manager across America. **B**ut before the sun had set, something truly amazing had happened. Something George could never have imagined—not even in his wildest dreams. **B**ecause during the day, George miraculously turned his sluggish, over-burdened 10 Mbit/s Ethernet LAN into a 70 Mbit/s Ethernet powerhouse. **A**ll by plugging in a single box no bigger than a hi-fi component. **A**ll without reconfiguring the basic layout of his LAN. **A**ll without FDDI. ***George's solution? The remarkable and proven EtherSwitch.™*** **B**ased on reliable switching technology that has stood the test of time, the EtherSwitch from Kalpana gives George a perfect and immediate solution to Ethernet congestion. **I**n fact, it's a dream come true! **B**ecause instead of sending a single packet one at a time, the EtherSwitch works like a telephone PBX to send multiple packets simultaneously. That's *Parallel Networking*. From the inventor of Ethernet switching technology. And it can add up to 70 Mbit/s performance or more! **P**lus George knows that with the amazing EtherSwitch, he will always be able to filter and forward 100% of all traffic with complete accuracy. And with low latency. **N**o wonder he feels like he's suddenly sitting on top of the world. ***So simple, all you do is plug it in.*** **F**ortunately for George, the EtherSwitch is also a snap to install. **A**nd it's as easy to operate as a household appliance. **B**y simply plugging it into his existing Ethernet LAN, he gets immediate results without reconfiguration. So from this day forward, whenever and wherever George sees congestion, he can simply plug in another EtherSwitch and become a hero all over again. ***A small price for such big improvements.*** **W**ith EtherSwitch, George is already beginning to reap an incredible return on his investment. **A**ll while adding new pep and unimagined vitality to his once lifeless Ethernet LAN. Plus he's leveraging his investment in existing Ethernet equipment. **A**nd best of all, these astonishing results come at a cost that's much, much lower than you would expect. Only $1,300* per port or less. **I**t's almost too good to be true! ***Perfect for all Ethernet applications.*** **G**eorge was also quick to discover that almost *every* situation can be improved with an EtherSwitch. **B**ecause with just the snap of a finger, he's dramatically speeding communication among two workers sitting side by side. And he's doing the same among two workgroups on different floors as well as two different divisions in two completely separate buildings. **H**e just adds an EtherSwitch wherever there's a delay. Then he lets it take care of everything else. Amazed? ***You too can have an incredible transformation!*** **G**eorge Gilbert is by no means the *only* network manager who is becoming an overnight sensation. **I**t could easily happen to you. And to your Ethernet LAN. **S**imply by adding the amazing EtherSwitch to your network right now. **T**o see how, all you have to do is fax Kalpana your current LAN configuration at 408/428-1161 (be sure to point out where congestion is occurring). And within 24 hours we'll respond with a customized, cost-efficient solution to boost Ethernet throughput. **O**r to see an EtherSwitch in action, call Kalpana now for your evaluation unit (800/488-0775).



Workgroup throughput multiplier
EtherSwitch boosts performance among and within workgroups.



Network backbone
With EtherSwitch, increased capacity occurs between buildings, departments and floors.



Front-end file server
EtherSwitch increases file server throughput and availability by giving each server 10 Mbit/s throughput.

look!
Named one of LAN Magazine's PRODUCTS OF THE YEAR for two years running!
LAN MAGAZINE
LAN MAGAZINE

Now you too can:

- Have a cost-efficient, plug 'n go answer to Ethernet congestion problems
- Boost Ethernet throughput to 70 Mbit/s without the high cost of FDDI
- Extend the life of your Ethernet LAN
- Discover a reliable solution that grows as your needs grow

Incredible things are just waiting to happen!

*Suggested Retail Price

Kalpana
The Parallel Networking Company

Circle Reader Service #102

LanFast creates the "wherever" network

Wherever there's a standard telephone jack, there can be a full-featured node on your existing Ethernet LAN. Just add a UDS LanFast™ network modem in the home office. It will give your people access to all your LAN resources from wherever you choose to set up shop.

LanFast is a LAN resident, dial-in/dial-out device, consisting of a V.32 *bis*/V.42 *bis* modem and a LAN adapter packaged in a single box. It supports Ethernet thick, thin or 10BaseT. Three levels of security deny access to unauthorized users, and a second high-speed serial port extends network reach by accommodating an external modem or high-speed digital device.

LanFast is shipped as a complete package. All necessary hardware and software are included. Standard modems (at speeds to 57.6 kbps) and popular communications programs, such as Procomm Plus Network and Crosstalk Mk. IV are supported.

Put some wherever into your home office LAN by adding LanFast now. Contact UDS at **800-451-2369**

For More Information, Call

IDE

A Full-service UDS Distributor
800-274-7238

UDS

MOTOROLA

Quality Means The World To Us.™

Circle Reader Service #107

See the Action Center for
networking products & services!

Use the Action Center Reader Service Card
and get free information
on networking products & services.

DATA NET ARCHITECTURES

NETWORK ARCHITECTURES, DATA NETWORK EQUIPMENT, STANDARDS AND ENTERPRISE NETWORK MANAGEMENT

Worth Noting

> "If SNMP is going to succeed, it has to be disconnected from TCP/IP."
>
> **Thomas Nolle**
> President
> CIMI Corp.
> Voorhees, N.J.

Data Packets

Andrew Corp. of Orland Park, Ill., next week is scheduled to unveil a controller that offers users several options for linking token-ring local-area networks to IBM mainframes.

The DataLynx/3174 TR is a multiport ASCII/3270 device that provides access to mainframe data from ASCII terminals, personal computers and printers via a token-ring or RS-232 connection. The controller attaches PCs and terminals on a token-ring LAN to a 3745 front-end processor, a 3174 or 3172 controller, or an Application System/400 attached to the mainframe.

Up to 24 asynchronous ports on the controller may be configured as data terminal equipment or data communications equipment ports to provide local and dial-up host access, Andrew Corp. said.

The DataLynx/3174 TR is priced from $4,995 to $9,995 and will be available next week.

Data Race, Inc. of San Antonio, Texas, last week signed an OEM agreement with **NEC Technologies, Inc.** of Boxborough, Mass., whereby NEC will resell Data Race's V.32bis data/facsimile modem for cellular networks.

The 9.6K/14.4K bit/sec modem will be sold as an integrated communications device for NEC's UltraLite notebook computers.

The financial terms of the arrangement were not disclosed.

Sprint to provide services for DARPA research net

Three-year trial to focus on high-speed imaging.

By Anita Taff
Washington Bureau Chief

KANSAS CITY, Mo. — The Defense Advanced Research Projects Agency (DARPA) has awarded Sprint Corp. a multimillion-dollar contract for a gigabit-speed research network linking supercomputers and high-speed workstations.

Experience gained from a three-year trial, which will center on a high-speed imaging application, will aid in the development of the federal government's proposed National Research and Education Network. The trial is one of several DARPA is underwriting to learn more about broadband data networks.

The trial will focus on military uses of imaging, but Sprint officials said it could aid in the commercial realm with such applications as medical imaging and molecular modeling.

Sprint will equip a previously unused fiber link with Synchronous Optical Network electronics to provide a dedicated 2.4G bit/sec backbone for the trial. The carrier is also donating Asynchronous Transfer Mode (ATM) equipment for the trial, but officials declined to specify which vendor will provide the gear.

There will be four locations on the network — the Minnesota Supercomputer Center, Inc. in Minneapolis, the Earth Resources Observation Systems Data Center in Sioux Falls, S.D., the University of Kansas in Lawrence, and the U.S. Army's Future Battle Laboratory in Fort Leavenworth, Kan.

According to Jerry Canavan, assistant vice-president of advanced service development at Sprint, the carrier hopes to find solutions to a number of problems that still hang over groundbreaking high-speed network efforts.

"Deployment of broadband networks is going to require a lot of research" to deliver the hardware, software and network capabilities needed for an end-to-end application, he said.

"We saw when we introduced ISDN that one of the biggest prob-

(continued on page 22)

Frame Relay Technologies unveils new access switch

By Jim Duffy
Senior Editor

COSTA MESA, Calif. — Frame Relay Technologies, Inc. recently brought out a frame relay switch that combines LAN routing, packet switching and multiplexing features, allowing users to mix multiple types of traffic on a single wide-area link.

As a router, the new FrameMux switch supports Transmission Control Protocol/Internet Protocol data from Ethernet local-area networks. But the switch can combine that traffic with other types of data — including X.25 and IBM Systems Network Architecture packets — while also allocating and deallocating bandwidth to various traffic sources according to available bandwidth and routing priorities.

FrameMux uses Time Division Multiple Access, a multiplexing technique that enables the switch to dynamically allocate bandwidth to active applications.

With FrameMux, 90% of a frame relay trunk's bandwidth can be made available to a single source when all other sources are idle. Due to their protocol processing, conventional routers use no more than 25% of a T-1 trunk's bandwidth for a single Ethernet-attached source, according to Abdul Aljaff, vice-president of engineering for Frame Relay Technologies.

On the local side, FrameMux supports an Ethernet connection plus three serial ports for synchronous and asynchronous devices. Synchronous transmissions run at 64K bit/sec, while the asynchronous rate is 38.4K bit/sec. FrameMux also offers T-1 access to the carrier network.

FrameMux provides either frame relay transport or traditional packet and circuit switching over all of its transmission

(continued on page 22)

MVS/ESA gets APPC face-lift

New release promises to remedy APPC-related shortcomings

Current MVS/ESA Version 4 Release 2:	New MVS/ESA Version 4 Release 3:
● No client/server application development facilities. ● Communications limited to 1 APPC session per application at a given time. ● Host address space required for each transaction or user. ● Mainframe memory hog.	● Fully implemented client/server application development facilities. ● Applications can support multiple simultaneous APPC sessions. ● Single-server address space may support multiple transactions or users concurrently. ● More efficient use of host memory facilities.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: IBM, WHITE PLAINS, N.Y.

APPC/MVS fighting for industry respect

IBM attempting to revitalize the subsystem with new release that offers improved performance.

By Michael Cooney
Senior Editor

WHITE PLAINS, N.Y. — As a linchpin in IBM's plan for giving the mainframe a key role in client/server environments, IBM's APPC/MVS subsystem faces a long battle for user and software developer acceptance.

Dogged by limited features and inefficient performance, the first release of APPC/MVS contained in MVS/ESA Version 4 Release 2 has been largely ignored by users and third-party software developers.

But IBM intends to change that. With the release of MVS/ESA Version 4 Release 3 in March of next year, IBM will add support for multiple sessions in a single application and improve performance, all with an eye toward making the mainframe a server of servers in the emerging client/server world.

"The traditional role for the MVS system is over, and IBM is now trying to revitalize it for the client/server world," said William Malick, program director for the software management strategies division of Gartner Group, Inc. in Stamford, Conn. "APPC/MVS is the kind of product that can actually make a System/390 attractive to the client/server environment."

The new release of MVS supports APPC Server facilities, which let users write APPC/MVS server applications that can handle multiple concurrent LU 6.2 sessions ("IBM targets host in client/server push," *NW*, June 22). Previously, an application could handle only one session at a time.

"By offering multiple concurrent sessions, IBM answered one of our biggest concerns," said Ross Altman, vice-president of advanced technology for Multi-Soft, Inc., a personal computer-to-mainframe cooperative processing software developer in Lawrenceville, N.J. "Without it, we would have had to write a massive program to handle multiple conversations ourselves, and that was too much."

Multi-Soft stopped development of its APPC/MVS product almost a year ago. But Altman said the new release of MVS and its APPC/MVS improvements have prompted Multi-Soft to reevaluate its interest.

Multi-Soft was not the only company that announced support for APPC/MVS in 1990 only to back away a short time later. Candle Corp. also said it would support the subsystem but has not yet released any products utilizing it. Of the 12 companies announcing support for APPC/MVS in 1990, about six have products.

But this halfhearted interest among software vendors is only one of the obstacles IBM faces in drumming up support for APPC/MVS. According to a study released last fall by market watchers at International Data Corp. (IDC) in Framingham, Mass., Advanced Program-to-Program Communications development on the mainframe is almost nonexistent.

Of the 75 sites IDC looked at,

(continued on page 22)

HP boosts net features of its POSIX operating system

MPE/iX V.4.0 boasts new Unix, IBM connectivity.

By Jim Duffy
Senior Editor

PALO ALTO, Calif. — Hewlett-Packard Co. last week enhanced the networking and interoperability features of its Portable Operating System Interface (POSIX)-compliant MPE/iX operating system to make it battle-ready for commercial data centers.

The new features in MPE/iX 4.0 include the Berkeley Sockets 4.3 interface for Unix application portability, enhancements to the Transmission Control Protocol/Internet Protocol transport stack that ease routing and increase performance, and products for sharing data with IBM and other systems via IBM LU 6.2 sessions.

The company also brought out a package that allows system managers to centrally monitor and control HP 3000 processors in a network.

Although most data centers use IBM MVS mainframes, many users are looking to port MVS applications to Unix servers in client/server environments, said Patrick Adamiak, a product marketing manager in HP's Commercial Systems Division.

To address that trend, HP has added support of Berkeley Sockets Version 4.3, a networking interface widely used in Unix environments. With the interface in MPE/iX, HP 3000 users can share data and applications with Unix systems that also support the interface, Adamiak said.

Another Unix-like feature of MPE/iX 4.0 is its TCP/IP transport protocol stack. The stack now includes a feature called Domain Names Resolver, which can route data to TCP/IP nodes without knowing the node's address.

It also supports four times the number of TCP/IP clients that TCP/IP for MPE/iX 3.1 supports — 4,096 as opposed to 1,024. Also, the new version has a 45% increase in throughput over Version 3.1 and uses 60% fewer CPU cycles.

"This is part of our strategy to put as many Unix-like capabilities on our [operating system as possible]," Adamiak said.

In addition to bulking up its Unix capabilities, HP also wants to extend connectivity with IBM systems. Toward that end, HP added token-ring interface cards and drivers to the HP 3000s.

It also added support for IBM's PU 2.1 to MPE/iX 4.0, which will allow HP 3000s to interact as peers with IBM and other vendors' PU 2.1 devices, such as IBM's Application System/400 minicomputer.

PU 2.1 will enable HP 3000s to share applications and data with other PU 2.1 nodes without going through an IBM mainframe, said Mark Hudson, HP 3000 networking product manager. That will allow for more direct routing of data and save mainframe processing cycles for other applications, he said.

MPE/iX previously supported IBM's LU 6.2 for sharing data between HP 3000s and IBM mainframes, but MPE/iX 4.0 supports 256 simultaneous LU 6.2 sessions instead of eight in MPE/iX 3.1.

On the systems management front, HP unveiled a console for managing networked HP 3000s. HP OpenView Console runs under MPE/iX on an HP 3000 server with a DOS-based user interface.

The console filters and groups messages according to particular functions, such as tape or print management, and displays them on one console or distributes them to as many as five consoles. MPE/iX 4.0 and the networking enhancements are scheduled to ship next month. The operating system is available at no additional charge with the purchase of an HP 3000.

The token-ring interface cards are priced from $2,000 to $12,900, which includes the TCP/IP transport protocol stack and Domain Names Resolver. PU 2.1 is included in HP's LU 6.2 Application Program Interface software, which is priced from $4,700 to $24,000. Pricing on the OpenView Console was not available at press time.

HP networks MPE/iX

New features in MPE/iX 4.0 add Unix look and IBM hooks

Berkeley Sockets Version 4.3
Allows HP 3000 to share data and applications with Unix systems.

Domain Names Resolver
Routes data to TCP/IP nodes, knowing only the node's name.

Token ring and PU 2.1
Attaches HP 3000s to token-ring LANs and allows them to interact as peers with IBM PU 2.1 devices.

Increased LU 6.2 sessions
Allows up to 256 LU 6.2 sessions, up from 8.

HP OpenView Console
Filters and groups messages according to user-defined parameters and delivers them to systems managers.

SOURCE: HEWLETT-PACKARD CO., CUPERTINO, CALIF.
GRAPHIC BY SUSAN SLATER

Bill to unshackle RBHCs passes hurdle in House

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — In a grueling and contentious five-hour meeting last week, a key House committee approved a bill that may allow the RBHCs to immediately begin manufacturing telecommunications equipment.

The bill, introduced in May by Rep. Jack Brooks (D-Texas), was approved by a vote of 24-9 in the U.S. House Committee on the Judiciary and will head for a full House vote unless the Committee on Energy and Commerce wins the chance to it.

A separate bill that would also allow the regional Bell holding companies into manufacturing passed the Senate last year, but the two are not identical and differences must be worked out if the House bill passes.

The bill would allow the RBHCs to begin manufacturing immediately and to enter long distance in five years if they can prove there is no substantial possibility they would impede competition in that market. It would also allow carriers to continue providing information services and to offer alarm services in five years.

Brooks, the powerful chairman of the Judiciary Committee, originally wanted to impose tougher conditions on the carriers. Before the changes drafted by the committee last week, the bill would have required the RBHCs to stop offering new information services and reapply to sell them in three years ("Bill would give Congress MFJ control," *NW,* May 11).

The initial provisions of the House bill also required the RBHCs to wait five years to manufacture and seven years to offer long-distance services.

Even though the bill last week reduced the amount of time the RBHCs must wait to enter new markets, the carriers said they were disappointed because of remaining restrictions. "Even with today's changes, [the bill] remains antijobs, anticonsumer and anticompetitive," BellSouth Corp. said in a statement.

However, a group of more than 1,600 consumer groups, user groups, newspapers and information service providers calling itself the Unity Coalition voiced support of Brooks' bill.

At the hearing last week, there was wide agreement that the RBHCs should not be allowed to enter new markets unrestricted because of their formidable control of the local loop. Many members of the committee expressed anguish over the effort to balance competing interests.

Lawmakers said the RBHCs could boost jobs, innovation and international competitiveness of the U.S. On the other hand, they said the possibility of anticompetitive conduct by the RBHCs is very real and existing competitors should be protected.

"We have embarked upon a course that is necessary, but one in which we are called upon to play Solomon," said Bill McCollum (R-Fla.).

At the hearing last week, Brooks said that despite the bitter lobbying his bill has sparked and accusations from the RBHCs that it is anticompetitive, the legislation would bring order to the telecommunications industry.

Since divestiture, the RBHCs have been whittling away at the business restrictions placed on them by the Modified Final Judgment on a piecemeal basis. Many of the proceedings have dragged on in the courts for years.

"An inquiry conducted by this committee unmistakably revealed spreading chaos" because of uncertainty over what the RBHCs will eventually be allowed to do, Brooks said.

Beyond the legal wrangling, a major source of that uncertainty was the Federal Communications Commission's possible role in overseeing RBHC entry into new markets. Previous MFJ-related bills have proposed putting the FCC in charge of overseeing RBHC entry into new businesses and monitoring the carriers to ensure that they do not act anticompetitively.

One big difference with the Brooks bill is that the Department of Justice, through the attorney general, would police RBHC activities.

"The FCC cannot do this job," agreed Mike Synar (D-Okla.), who serves on both the Judiciary Committee and the House Subcommittee on Telecommunications and Finance. "The MFJ is being violated right now — that's a fact," he said, so Congress must lay out new rules for the industry.

But several members of the committee said they do not want to hamstring the RBHCs. "We're tying up American businesses in so much red tape that the only ones who are winning are foreign companies," said Roman Mazzoli (D-Ken.).

AT&T gives SDN routing

continued from page 1

cally routing traffic from busy sites to other centers.

"Using SDN to carry rerouted calls typically makes better sense than T-1s when call centers are more than 50 miles apart," said Lisa Pierce, AT&T's ISDN product manager. "This assumes moderate use of Look Ahead Interflow."

Look Ahead Interflow is more sophisticated than AT&T's Alternate Destination Redirection feature, which routes overflow traffic to other centers but does not enable users to determine if agents at the other sites are free to answer them.

AT&T is the only carrier that offers an 800 routing feature that can be used to intelligently route calls from a swamped call center to other such facilities.

AT&T has upgraded software in its 120-plus 4ESS network switches to enable them to understand the ISDN progress messages sent between private branch exchanges to determine whether an alternate site can handle a rerouted call.

With Look Ahead Interflow, a PRI-equipped Definity 2 or 3 or a System 85 PBX can use the PRI's D signaling channel to determine which call centers have agents free to field calls.

If the alternate location accepts the call, the incoming Megacom 800 call is bridged in the originating PBX to an outgoing SDN call and carried to the alternate location. If the alternate location rejects the call, it remains in a queue at the primary site.

Look Ahead Interflow was initially used in private networks to route calls that could not be answered quickly over leased lines to other sites. The enhanced version routes overflow calls through AT&T's public network.

The carrier recently conducted a beta test of the public network version but would not identify the user participant. AT&T's Pierce said the process of using Look Ahead Interflow to query a second site — and transfer a call — took an average of 1.4 to 1.9 seconds per call.

Users with multiple call centers expressed strong interest in the public network version of Look Ahead Interflow.

"We're consolidating our customer service operations from six call centers to two or three," said John Boyd, communications systems supervisor for Northeast Utilities, a Hartford, Conn., utilities company. "And we'll definitely use Look Ahead Interflow to replace T-1s between the centers. The bottom line is that it will help us cut costs and get to customers faster." Boyd said he has

(continued on page 48)

THERE ARE TWO PLACES WHERE COMPLEX NETWORK INTEGRATION PROBLEMS CAN BE WORKED OUT.

Circle Reader Service #112

YOUR PLACE

As surprising as it may seem, there are many clone companies that boost profit margins by not hiring enough designers and doing dangerously little testing. What does it all mean? It means that your network is the unofficial test site for their server.

Introducing the design and testing engineers of our Systems Division at Compaq headquarters in Houston, Texas.

These are the same people who've built our reputation for developing the servers of choice in the computer industry.

In fact, in a recent survey, the readers of *LAN Times* selected COMPAQ 386- and 486-based file servers over all others—including IBM, Northgate, Dell and AST—for the second year in a row.

Becoming this good requires rigorous network testing for months. This process—which we believe has no equal in the entire PC server industry—is referred to affectionately as "The Meat Grinder."

© 1992 Compaq Computer Corporation. All rights reserved. Printed in the USA. COMPAQ, SYSTEMPRO Registered U.S. Patent and Trademark Office. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. *This limited warranty service is provided by contract Service Providers and may not be available in certain geographic locations. Consult Compaq Customer Support Center for further details.

OR OURS.

Virtually every conceivable kind of test is run using literally hundreds of different applications, configurations and cards. Running on the world's four most popular network operating systems.

But to be perfectly honest, not all development and testing takes place at our place.

Because the engineers at Novell, SCO, Microsoft and Banyan—in long-standing technical alliance with Compaq—work to make sure that you get both the easiest integration and highest performance possible.

Unfortunately, those engineers were unable to make it to the above photo session.

Nor could the specialists who created the COMPAQ ToolKits and TechNotes—the industry's most sought-after guides for multi-vendor network integration.

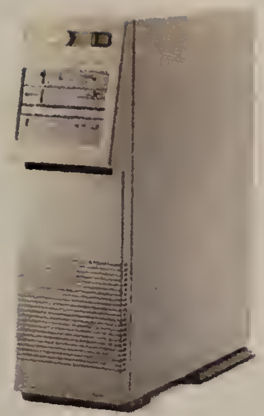
Or the thousands of technicians who provide you with a full year of free, on-site service.*

Or the experts who staff our free technical support line, resolving 95% of your questions in 15 minutes or less.

For more information about everything Compaq has to offer, just call us at 1-800-345-1518, ext. 200 in the U.S.A.

In Canada, call us at 1-800-263-5868, ext. 200.

When it comes to PC server-based computing, you'll see there really is only one place to go.



The new enhanced COMPAQ SYSTEMPRO models feature the latest drive array controller, dramatically increasing I/O throughput.

The COMPAQ Server Manager/R lets you monitor and diagnose your server remotely. In the event of a problem, it calls your beeper—preventing any downtime before it happens.

NOVELL. SCO Microsoft BANYAN

Our key technical alliances with major operating systems ensure optimum performance and support of your PC network.

COMPAQ

Circle Reader Service #112

OS/2 2.0 is here to stay.

This special $49 offer isn't.

Run DOS applications. Run Windows™ applications. Run OS/2® applications. OS/2 2.0 can let you run them all—all at once, in separate windows on the same screen. With so much to offer, OS/2 2.0 will be around for some time. But these low prices won't.

For a limited time, you can upgrade to OS/2 2.0 from Windows for just $49; $99 from any DOS. That's a lot less than the cost of DOS and Windows. And OS/2 gives you the capabilities of both. Plus all the added benefits of OS/2 2.0—including Adobe Type Manager.™

In fact, at these special introductory prices, no other operating system can let you do so much. For so little. For an IBM authorized dealer near you, or to order OS/2 2.0 from IBM at these special introductory prices, call the number below.

Call 1 800 3-IBM-OS2.*

- *Runs DOS, Windows and OS/2 programs.*
- *Runs more than one program at a time.*
- *Supported on most 386 SX PCs and above.*
- *Upgrade from Windows to OS/2 2.0 for $49; $99 from any DOS.***

*In Canada, call 1 800 465-7999. **Upgrade from Windows, $49; upgrade from any DOS, $99; $139 base operating system. These prices valid only when ordered directly through IBM. Proof of purchase required. Dealer prices may vary. Offer valid in U.S.A. only, expires 7/31/92. Shipping and handling not included. IBM and OS/2 are registered trademarks of International Business Machines Corporation. All other products are trademarks of their respective companies. © 1992 IBM Corp.

IBM®

LOCAL NETWORKING

LAN HARDWARE, NETWORK OPERATING SYSTEMS AND LAN MANAGEMENT

Worth Noting

"IBM had a real opportunity to play interoperability mitigator between Microsoft and Novell, but they blew it because they are so mad at Microsoft. If they had, they could be playing a different role [in the LAN industry] other than reselling NetWare."

Jamie Lewis
Vice-president of
information services
The Burton Group
Salt Lake City

Netnotes

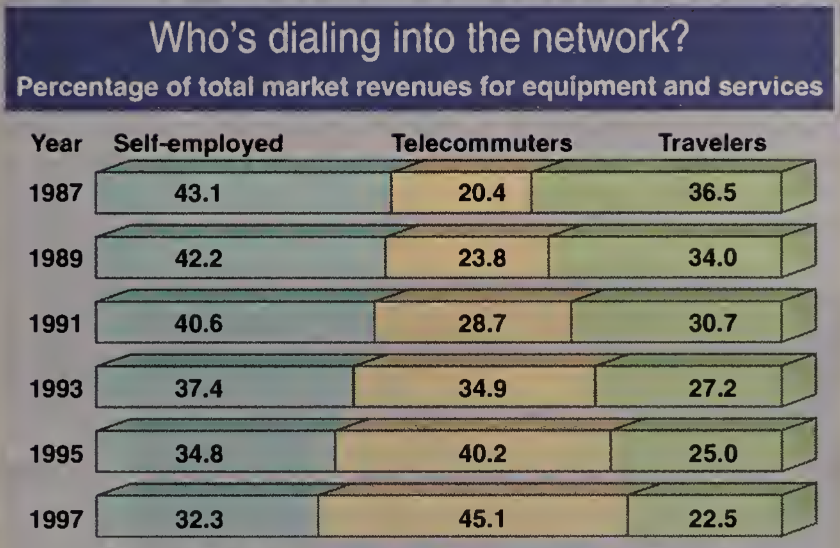
Tekelec, Inc., based in Calabasas, Calif., has announced Release 3.0 of its ChameLAN 100 protocol analyzer with support for the Fiber Distributed Data Interface.

With the release, the analyzer can decode Ethernet and FDDI traffic simultaneously, letting the administrator more easily troubleshoot nets with, for example, Ethernet local-area networks connected over an FDDI backbone.

All products are available now. Pricing for the portable ChameLAN 100 starts at $37,500, and Release 3.0 for FDDI is free of charge to existing customers. The Ethernet analysis option, which involves a hardware and software upgrade, costs $5,000.

Castelle Corp. has rolled out a new version of its FaxPress local-area network facsimile server. The new version, 3.0, now includes automatic routing capabilities, sending incoming faxes to their final user destination without administrator inter-

(continued on page 17)



Who's dialing into the network?

Percentage of total market revenues for equipment and services

According to a recent study, by 1997, telecommuters will spend the most on software, hardware and services for dialing into their home office networks and hosts. Today, self-employed users ring up the biggest bill.

SOURCE: MARKET INTELLIGENCE RESEARCH CORP., MOUNTAIN VIEW, CALIF.

GRAPHIC BY SUSAN J. CHAMPENY

Intel intros bevy of SNMP, NetWare LAN mgmt. wares

Products to monitor work group environments.

By Skip MacAskill
Staff Writer

HILLSBORO, Ore. — Intel Corp. last week rolled out new and enhanced products that will ease management of work group environments.

Included in the announcements were new personal computer-based hub boards, the first product in Intel's SNMP Series network management family and an enhanced version of LANSight Support for Novell, Inc. NetWare environments.

Version 3.0 of LANSight Support for NetWare 2.X or 3.1X local-area networks is software that enables administrators to monitor workstations on NetWare LANs. The product can now run under Microsoft Corp. Windows 3.X or DOS and offers a real-time messaging feature that lets a net manager "chat" with a user when accessing a node.

Each time the net administrator establishes a link to a node, LANSight Support provides management information, including type of PC, video adapter and memory options. The software also provides access to other net devices, including file servers, print servers, mail gateways and facsimile servers, from a single location.

Intel also offers a version of LANSight Support for Microsoft LAN Manager and IBM LAN Server networks. The enhancements found in NetWare Version 3.0 will soon be extended to this version.

LANSight Support for NetWare is available now and costs $395.

New SNMP agent

Also announced was a Simple Network Management Protocol agent for LANs using Intel's family of EtherExpress and TokenExpress LAN Adapters. The agent is the first in the company's SNMP Series line and runs as a NetWare Loadable Module (NLM) on a NetWare 3.11 LAN.

It allows the net administrator to collect PC-level management information on NetWare LANs and report it to consoles running third-party SNMP management systems, such as SunConnect's SunNet Manager, Hewlett-Packard Co.'s OpenView and Lexcel's Lance+, by using a node management agent from LANSight Support.

Intel's SNMP Services software is available now and costs $795 for a single license that supports as many as 250 workstations.

The company also expanded its line of PC-based hub boards with new additions geared to NetWare 3.11 and other network operating system environments.

Intel's new Remote Hub Agent for Novell NetWare Hub Services is an SNMP agent for its EtherExpress TPE Hub cards used in NetWare 3.11 networks.

The software allows the hub card in a DOS-based PC anywhere on a NetWare 3.11 LAN to be managed by Novell's management tools, including the HubCon

(continued on page 16)

Everex brings fault tolerance to NetWare

New dual server to run forthcoming Novell mirroring software to give users a more reliable NetWare.

By Margie Wylie
Senior Editor

FREMONT, Calif. — Months before Novell, Inc. releases its NetWare server mirroring software, Everex Systems, Inc. plans to start shipping a double server that will enable the software to provide even more fault tolerance than Novell intended.

The Step Multi-Processing Fault-Tolerant 2001 will offer users two complete servers in one chassis connected by a 25M byte/sec internal bus.

Courtesy of Novell's forthcoming System Fault Tolerance Level III (SFT III) software, the dual server will mirror every network transaction on both servers. If one fails, the other will take its place, allowing the failed server to be repaired while the other keeps the network up.

Novell codeveloped the NetWare Loadable Module (NLM) SFT III software with Compaq Computer Corp., which next year will offer special Extended Industry Standard Architecture (EISA) cards that connect two stand-alone Novell NetWare servers to mirrored servers at 100M bit/sec through fiber-optic cabling.

What will differentiate the Step server from Compaq's solu-

(continued on page 17)

> The dual server will mirror every network transaction on both servers.

▲▲▲

IBM demos first of new CID management tools

By Caryn Gillooly
Senior Editor

NEW YORK — As expected, IBM recently demonstrated the first of a family of new tools for helping users centrally manage software installation, distribution and LAN configuration.

The demo, held at PC Expo here, gave users their first glimpse at products resulting from the Configuration, Installation and Distribution (CID) strategy IBM revealed in April ("IBM prepping open LAN mgmt. platform," *NW,* April 13).

The C word

The first product in the CID strategy is under the C category and has been dubbed the System Configuration Manager, according to Art Olbert, PS director of LAN systems at IBM's personal systems division in Somers, N.Y.

The program is designed to let a local-area network administrator configure all logical LAN connections — that define which devices can talk to one another — from a single console and with as much ease as playing a video game.

At the top of the IBM Presentation Manager screen were icons of different network nodes: a server, workstation and database, for instance. To build the logical LAN on the management console, the administrator only has to drag icons down from that top portion and drop them in a lower portion of the screen — first the server, then a workstation and so on.

If the administrator has to configure more than just a few links of the same type, the program can simultaneously forge as many as 99 similar connections, so that person does not have to add them one at a time.

To establish the connections between the devices, the administrator only has to "draw" a line on the screen, such as from a workstation to the server. If the

(continued on page 16)

IBM demos first of new CID mgmt. tools

continued from page 15

person attemps to connect noncompatible nodes — such as a database to a workstation that does not have database capabilities — an error message will appear. Then, the administrator only has to click on the icon of the workstation and change the necessary parameters.

"This offers an iconic way to do configuration," Olbert said during a PC Expo presentation. "It automatically establishes NETBIOS links [between network nodes]" and can be manually configured to support Transmission Control Protocol/Internet Protocol links.

The tool can also automatically discover nodes already connected on a network, letting the administrator more easily add new nodes to an existing net.

Finally, the tool will also let administrators "drag and drop" applications onto appropriate network nodes, providing some basic software distribution capabilities, according to Buck Kipe, program manager of OS/2 distribution at IBM's system management products division. He would not provide further details on this capability.

The I word

IBM executives also demonstrated the first installation program that will be part of the CID strategy.

According to Kipe, the initial program release is intended to ease code installation on each workstation when building a network.

The end user will have to insert two diskettes into the workstation in order to load software, such as OS/2, and then type in the user name.

The workstation can then receive software distributed from a central workstation equipped with IBM's installation software.

Today, an end user needs as many as 20 diskettes to load OS/2, for example.

Although it will not appear in the first release, each workstation will ultimately contain an agent that the server will be able to "wake up" in order to load software, even when the end user is not present, Kipe said.

He added that while an end user only has to enter a name with the two-diskette approach, the completely unattended version will not require that.

> The tool will also let administrators "drag and drop" applications onto appropriate network nodes, providing some basic software distribution capabilities.
>
> ▲▲▲

IBM did not demonstrate any new software distribution tools, but executives reiterated that this part of CID will be realized through its existing IBM NetView DM and NetView DM/2 products.

New performance tool

Although unrelated to the CID demonstrations, IBM executives also demonstrated a new version of its System Performance Monitor tools that the company plans to roll out this fall. The tools basically support LAN administration from a central location.

The new Version 2.0 will have the same CPU, disk and memory utilization tracking capabilities, among other statistical information, available with the current version but will be based on a 32-bit architecture and will support OS/2 Version 2.0. ■

Intel to introduce bevy of mgmt. wares

continued from page 15

hub management facility and HubSNMP NLM. The Remote Hub Agent costs $99 and is available now.

EtherExpress hub adapters

Intel also rolled out a line of network operating system-independent EtherExpress TPE Hub adapters that make it possible to transform a DOS PC into a managed hub for about the same price as a standalone, unmanaged hub, according to the company.

The EtherExpress hub adapters include client drivers for net operating systems such as Novell's NetWare Lite, LAN Manager, Banyan Systems, Inc.'s VINES and Artisoft Corp.'s LANtastic.

The adapters, available now, are priced between $649 and $849. ■

3 good reasons to attend COMNET

July 21-23, 1992
Moscone Convention Center
San Francisco, California

...and they're FREE!

co-sponsored by NETWORK WORLD

1. FREE SHOW ADMISSION (a $30 value ... good for all three days)

- Meet **over 100 leading manufacturers** and suppliers showcasing the latest advances for LANs, WANs, fiber optics, SMDS, Frame Relay, SONET and other high speed technologies ... and more
- Be among the first to see dozens of mid-year **new product releases** at the West Coast's **FIRST** major network event of the year
- Discover hundreds of **creative, affordable answers** you can implement immediately

Exhibit Hall Hours:	10:00 am - 5:00 pm Tuesday and Wednesday, July 21 and 22
	10:00 am - 4:00 pm Thursday, July 23
Questions:	Call 800-225-4698

2. FREE KEYNOTE & PLENARY SESSIONS

Tues., July 21 9:45 - 10:45 am	*Keynote*: **Eric A. Benhamou**, President and CEO of 3Com Corporation, "Building Tomorrow's Networks Today"
Wed., July 22 9:45 - 11:30 am	*Plenary Session*: **Tom Steding**, VP Marketing, Network Systems, 3Com Corporation, and **Bob Young**, VP NetWare Products Division, Novell, "Enterprise Networking"
Thurs., July 23 9:45 - 10:45 am	*Keynote*: **Jack Hancock**, Executive Vice President, Product and Technology Support, Pacific Bell, "Carrier Capabilities in Supporting Broadband Applications"

3. FREE INTRODUCTORY CONFERENCE SESSIONS

When you arrive, you'll receive a pass good for one of the following introductory-level sessions. ***Please arrive early – free sessions are available on a first-come, first-served basis until the room is full.***

- **Intro to Telecommunications**
  Tues., July 21, 8:30 - 9:30 am or
  Thurs., July 23, 8:30 - 9:30 am
- **Intro to Broadband**
  Tues., July 21, 8:30 - 9:30 am or
  Thurs., July 23, 11:30 am - 12:30 pm
- **Protocol Primer: Appletalk, DECnet & SNA**
  Tues., July 21, 8:30 - 9:30 am
- **Intro to Frame Relay**
  Wed., July 22, 1:30 - 3:00 pm
- **Understanding Intelligent Hubs**
  Wed., July 22, 8:30 - 9:30 am
- **Intro to Open Systems: Enterprise Networking**
  Thurs., July 23, 8:30 - 9:30 am

Learn to **increase productivity ... expand service ... cut costs** during nearly 60 conference sessions and in depth tutorials – 1992 Conference Theme: ***"High Performance Network Strategies: The Broadband Era."*** Plus, master the business of networking in a new ***Executive Symposium*** for senior-level managers. *(Separate registration required. Call 800-225-4698).*

To take advantage of these FREE offers, just bring this ad with you to the Show!

ComNet™ is produced by World Expo Corporation, an International Data Group Company, the world's leading source of information services on information technology.

NWT

Free Information for Readers of NETWORK WORLD

NETWORK WORLD

LEAD SERVICE

Issue date July 6, 1992

Card must be received by October 30, 1992

Name
Title
Company
Street
City
State Zip
Phone Fax

☐ ***URGENT***

1. Action requested
1 ☐ Request for sales call
2 ☐ Request for proposal
3 ☐ Request for information

2. Purchase timeframe
4 ☐ Within 60 days
5 ☐ Within six months
6 ☐ Within one year

3. Scope of purchase responsibility
7 ☐ Enterprise wide
8 ☐ Departmental

4. Purchase influence/number of sites
9 ☐ One site
10 ☐ 2-9 sites
11 ☐ 10-20 sites
12 ☐ 21+ sites

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140	141	142	143	144	145
146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175

NETWORK WORLD

LEAD SERVICE

Issue date July 6, 1992

Card must be received by October 30, 1992

Name
Title
Company
Street
City
State Zip
Phone Fax

☐ ***URGENT***

1. Action requested
1 ☐ Request for sales call
2 ☐ Request for proposal
3 ☐ Request for information

2. Purchase timeframe
4 ☐ Within 60 days
5 ☐ Within six months
6 ☐ Within one year

3. Scope of purchase responsibility
7 ☐ Enterprise wide
8 ☐ Departmental

4. Purchase influence/number of sites
9 ☐ One site
10 ☐ 2-9 sites
11 ☐ 10-20 sites
12 ☐ 21+ sites.

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140	141	142	143	144	145
146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175

NETWORK WORLD

LEAD SERVICE

Issue date July 6, 1992

Card must be received by October 30, 1992

Name
Title
Company
Street
City
State Zip
Phone Fax

☐ ***URGENT***

1. Action requested
1 ☐ Request for sales call
2 ☐ Request for proposal
3 ☐ Request for information

2. Purchase timeframe
4 ☐ Within 60 days
5 ☐ Within six months
6 ☐ Within one year

3. Scope of purchase responsibility
7 ☐ Enterprise wide
8 ☐ Departmental

4. Purchase influence/number of sites
9 ☐ One site
10 ☐ 2-9 sites
11 ☐ 10-20 sites
12 ☐ 21+ sites

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115
116	117	118	119	120	121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140	141	142	143	144	145
146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.716 PITTSFIELD, MA

POSTAGE PAID BY ADDRESSEE

NETWORK WORLD

The Newsweekly of Enterprise Networking Strategies

P.O. Box 5090
Pittsfield, MA 01203-9838

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.716 PITTSFIELD, MA

POSTAGE PAID BY ADDRESSEE

NETWORK WORLD

The Newsweekly of Enterprise Networking Strategies

P.O. Box 5090
Pittsfield, MA 01203-9838

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO.716 PITTSFIELD, MA

POSTAGE PAID BY ADDRESSEE

NETWORK WORLD

The Newsweekly of Enterprise Networking Strategies

P.O. Box 5090
Pittsfield, MA 01203-9838

Everex brings fault tolerance to NetWare

continued from page 15

tion is additional NLMs that work in conjunction with SFT III, allowing the two servers to constantly monitor each other's hardware and software, checking for failures and synchronizing data, said Larry Samaritan, general manager of Everex's advanced systems division.

"SFT III is attempting to provide fault tolerance without knowing much about the hardware," Samaritan said. As a result, the software is prone to being fooled into thinking that when a server is busy, it has failed, which can cause the software to switch to the alternate server and shut down the main server, he explained.

Everex's Step will not only keep both servers operating in such a scenario, but will also be able to keep both synchronized if one falls behind the other, according to Samaritan. "We are going to make a better SFT than Novell," he said.

The Step server will also offer redundancy within each separate system. For example, each server holds two copies of everything in memory and offers some redundancy in storage. "We could lose one disk from each of the two arrays and still operate," Samaritan said.

The $47,000 model will offer dual Intel Corp. 486DX/2 55-MHz CPUs, uninterruptible power supply systems, power supplies, 16M-byte memory modules (each expandable to 64M bytes), LAN adapters, EISA I/O buses, tape backup, floppy drives, Super VGA graphics boards and redundant array of inexpensive disks-3 of 500M bytes (each expandable to 10G bytes).

Compaq officials, however, point out that the two-in-one server will make for an expensive desktop computer when it becomes obsolete.

"In the hardware industry, there's a saying that today's server is tomorrow's desktop machine," said John Sweeney, public relations program manager for the Houston-based hardware maker. "Our EISA card will be able to mirror any two servers that can be taken apart and put on the desktop when it is time to upgrade the server."

Compaq has not announced a name for its product, when it will be released, how much it will cost or how it will be sold.

"SFT III isn't even available yet," Sweeney said.

Everex plans to start shipping the Step with beta SFT III software that Novell will offer on a selective, limited release in the third quarter.

The final release of NetWare SFT III will not ship until six months after NetWare Version 4.0, which is due late this year or early next, according to Novell. At that time, Everex will update current customers for free, according to Samaritan. ◘

Netnotes

continued from page 15

vention. It also supports full integration with Novell, Inc. printing facilities and its naming bindery, Microsoft Corp. Windows, and electronic mail faxing using the Message Handling Service (MHS).

FaxPress 3.0 will be available in the fall for Novell NetWare, Microsoft LAN Manager and IBM LAN Server environments with either single or dual phone lines, the latter of which sends and receives information.

Pricing has not been set.

What do you get when you cross DDE with IPX? Not just alphabet soup, according to **Netlogic, Inc.** The New York-based software maker recently introduced its DDEX 3.1, a network version of Microsoft Corp.'s Dynamic Data Exchange interapplication communications protocol that runs over rival Novell, Inc.'s Internetwork Packet Exchange network protocol.

By combining IPX with DDE, the Windows method for sending information and commands between applications, DDEX 3.1 allows DDE-enabled applications to interact over a NetWare network link without modification.

At $449, $799 and $1,590 for three, six and 12 users, respectively, DDEX 3.1 does not come cheap, but the company seems to think that extending DDE's functionality through IPX will make it worth the price.

Microsoft will not offer a net-enabled version of DDE until it ships its Windows for Workgroups later this year. Even then, Microsoft's NetDDE, which will use its LAN Manager's less popular Network Basic I/O System Extended User Interface protocol for transport, will not support IPX.

Any application that currently works with local DDE, such as Microsoft Excel or Word for Windows, can use DDEX, which translates local calls into remote calls.

Netlogic also offers developers an extended set of application program interfaces that rely on IPX to give developers access to networking capabilities not available through DDE alone. ◘

TEST YOUR CABLING BEFORE YOU PUT EVERYTHING ON THE LINE.

Tightrope walkers always test their cables before they set foot on them. Because they know if one of them goes down, they all go down. ⚡ The same can be said about managing a network. Which is why you should test your cables first. ⚡ Microtest offers a family of cable diagnostic and certification tools that can pinpoint cabling problems on any network. ⚡ From the menu-driven QUICK SCANNER,™ to our token ring specialist RING SCANNER,™ or the industry standard CABLE SCANNER, Microtest Scanners provide you with quick, cost-effective answers for trouble-free LAN operation. For advanced troubleshooting we have the powerful PAIR SCANNER® and our certification expert, MT340 SCANNER.™ ⚡ The results are always spelled out for you in non-technical terms (i.e. "Short at 270 ft."). ⚡ For a complete description of our line of Scanners, call 1-800-526-9675. And we'll make sure you're a little less vulnerable when your you-know-what is on the line.

MICROTEST®

© 1992 Microtest, Inc., 3519 E. Shea Blvd., Phoenix, AZ 85028 (602) 971-6464. Fax: (602) 971-6963.
QUICK SCANNER, RING SCANNER, PAIR SCANNER, MT340 SCANNER and Microtest are trademarks of Microtest, Inc.

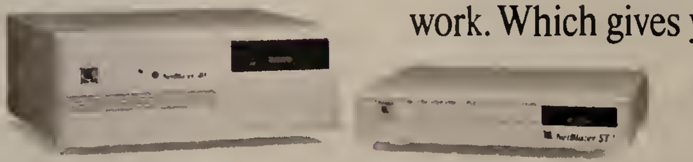
Circle Reader Service #104

A Lot Of Our Customers Choose *NetBlazer*™ Dial-Up Networking For Some Very Remote Reasons.

NetBlazer. The Most Affordable Way To Expand Your Network.

Connecting remote LANs and computers to your enterprise network has been complicated and cost-prohibitive for most companies. Until Telebit invented Dial-Up Networking.

Many routers provide leased-line capabilities. But unlike others, the NetBlazer family of communications servers also offers the versatility of using telephone dial-up or ISDN lines to create extensive, virtual wide area networks through the use of the Public Switched Telephone Network. Which gives you the flexibility to network from any location where there's a telephone, without paying the high cost of leased lines.



The NetBlazers' LAN-based communications capabilities make them powerful tools for applications including remote telecommuting, small office connectivity, remote network management, and leased-line backup.

Call **1-800-TELEBIT** for a free NetBlazer Application Guide, and see for yourself how far remote networking can take you.

TELEBIT®
First in Dial-Up Networking.

Call us today for information on the NetBlazer seminar coming to a location near you.

© 1992 Telebit Corp. (408) 734-4333. (800) 835-3248. FAX: (408) 734-3333. 1315 Chesapeake Terrace, Sunnyvale, CA 94089-1100. Telebit is a registered trademark and NetBlazer is a trademark of Telebit Corp.

Circle Reader Service #106

INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

"It's better to have some conviction or opinion than to remain neutral or not say anything at all."

George Prodan
Product-line manager
for high-speed products
3Com Corp.
Santa Clara, Calif.
On the politics of voting
at ANSI standards meetings

Link Notes

CrossComm Corp. this week will announce an X.25 wide-area network module for its ILAN Universal Router that will enable users to route traffic based on the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange (IPX) and IBM's Network Basic I/O System over X.25 nets.

The module will be available next month and will cost $950.

For more information, call (508) 481-4060.

Develcon Electronics, Inc. has announced an Ethernet bridge equipped with an Integrated Services Digital Network terminal adapter that enables users to link local-area networks over ISDN lines.

The I-Gate Model-150 ISDN Bridge supports an ISDN Basic Rate Interface, with two 64K bit/sec B channels available for point-to-point or multipoint bridging.

To minimize line costs, the bridge is equipped with a time-of-day connection facility to allow calls only at specific times. In point-to-point operation, the bridge's bandwidth-on-demand facility establishes a second B channel connection if traffic on the first reaches a programmable threshold and then clears the

(continued on page 27)

Penril fills out low end of its Ethernet bridge line

Two new models offer SNMP mgmt., WAN links.

By Skip MacAskill
Staff Writer

GAITHERSBURG, Md. — Penril DataComm Networks, Inc. last week filled out its Ethernet bridge line with the introduction of two low-end devices that offer SNMP management and dual WAN links at an entry-level price.

The new Series 1200 bridge family consists of the 1210 Local Ethernet Bridge and 1220 Remote Ethernet Bridge. The new devices, which support the Spanning Tree Protocol, complement Penril's high-end Series 2000 and mid-range Series 2500 bridges.

The 1210, which can bridge two local Ethernet segments together, supports 10Base-T, 10Base2 and 10Base5. It also handles media conversion between dissimilar networks.

It has a forwarding rate of 11,000 packet/sec and filters local- from wide-area traffic at a rate of 17,500 packet/sec.

The 1220 can bridge one Ethernet segment to as many as two wide-area network links operating at speeds between 512K bit/sec and 2.048M bit/sec. It supports several physical interfaces, including RS-232, RS-530, V.11 and V.35.

The bridge has the same filtering rate as the 1210, and its forwarding rate depends on the type of interface employed.

The product offers some intelligent bridging capabilities, including the ability to bridge traffic to an alternate route in a meshed network if a primary link fails. It also provides load-sharing and dial-backup.

The product offers some intelligent bridging capabilities, including the ability to bridge traffic to an alternate route in a meshed network.

▲▲▲

Because the 1220 has two WAN links, users can employ one to back up the other in case of failure or to alleviate traffic congestion on the primary line. Ei-

(continued on page 27)

Luxcom unveils low-end token-ring/Ethernet hub

By Maureen Molloy
Senior Writer

FREMONT, Calif. — Luxcom, Inc. last week announced a low-end intelligent hub that supports as many as 128 token-ring or 96 Ethernet nodes at distances up to 100 meters over unshielded twisted pair.

The new Series 500 consists of the Control Module and up to eight Access Modules, all housed in the Base Module. The Control Module contains the hub's power supply and a 100M bit/sec backplane. The Access Modules include a 12-port Ethernet version and a 4M or 16M bit/sec token-ring version with 16 ports. All modules are hot-swappable.

Although the Series 500 supports token ring- and Ethernet-based devices only, it can be upgraded to Luxcom's Series 2000 Multiplexing Hub, which also supports connections to cluster controllers and wide-area networks.

The Multiplexing Hub is a hybrid between an intelligent hub and a WAN multiplexer. It supports applications that require low delay — such as IBM terminal- and local-area network-based applications — as well as isochronous applications, such as multimedia, videoconferencing and voice applications.

The Series 500 LAN Hub is available now. The Base and Control Modules cost $990 each. The Access Modules range in price from $1,295 to $1,995, depending on configuration. Fully configured Series 500 LAN Hub systems cost $3,000 to $16,950 for a 128-port token-ring setup. ◼

Dialing up the internet savings

Dial-up lines can be cost-effective alternative to leased lines.

	Dial-up service rates (per hour)[1]	Monthly leased 56K bit/sec link rates[2]	Break-even point (in hours)
Rates do not include a $12 per month service charge			
10 miles	$0.60	$137	208
100 miles	$9.60	$732	75
1,000 miles	$14.40	$1,224	84
2,000 miles	$15.00	$1,759	116
2,500 miles	$15.00	$1,931	128

[1] Long-distance rates from AT&T; local access rates from Pacific Bell

[2] AT&T end-to-end digital data service lines, including local access

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: INFONETICS RESEARCH, INC., SAN JOSE, CALIF.

Dial-up links finding new role in internets

More and more vendors offer this economical means to provide redundancy, handle overflow.

By Maureen Molloy
Senior Writer

As organizations become increasingly decentralized, users are looking to dial-up internetworking as a way to cost-effectively hook small remote sites into a corporate internet.

Companies have discovered that tying sites in via ubiquitous analog dial-up lines and switched digital lines is often an effective and inexpensive alternative to leased 56K bit/sec digital lines. In addition to linking remote users on an as-needed basis, dial-up internetworking can also be used to economically back up primary wide-area leased lines, handle overflow during peak traffic periods and provide remote network management.

Although today only a few vendors offer dial-up capabilities on their bridge/routers, almost all have promised support within the next year.

This past spring, Telebit Corp. introduced a dial-up multiprotocol router for Ethernet and token-ring networks that supports wide-area analog dial-up links at speeds up to 57K bit/sec by using data compression and improved modem technology.

Cisco Systems, Inc. offers a software capability that lets its routers use switched digital dial-up circuits to handle overflow traffic on dedicated private lines.

The vendor more recently announced a dial-on-demand capability that enables Cisco routers to send asynchronous traffic over multiple dial-up analog lines at speeds up to 38.4K bit/sec. The feature is intended to lets users employ a dial-up line as the primary link into a corporate internet from small sites, as opposed to only being used as a backup.

A spate of other internetworking vendors will begin rolling out similar products over the next year that utilize the public switched network, including Advanced Computer Communications, Retix, 3Com Corp., Wellfleet Communications, Inc. and Xyplex, Inc.

"Dial-up is not a niche market but something that will eventually be as big as the mainstream router market."

▲▲▲

"Dial-up is not a niche market but something that we believe will eventually be as big as the mainstream router market since, more and more, there will be user sites that can't cost-justify a dedicated line to the corporate internet," said Fritz Mueller, network product manager at Telebit.

Previously, low speeds and high error rates made internetworking over the switched telephone network an impractical option for most users. But the shift to ultraclean fiber-optic transmission facilities by many carriers and improvements in dial-up modems is changing that,

(continued on page 27)

To frame relay users tired of being stuck in traffic, Sprint offers the fast lane.

We know. They told you frame relay could zap huge amounts of data from LAN to LAN with lightning speed. But eventually, you found out they could only send your data in dribs and drabs.

Well, take heart. Sprint's Frame Relay service is unlike the others. Because ours doesn't limit the flow of data into the network. Instead, it gives you the capability to send longer bursts of data. Net result: Less delay and greater throughput. Net net result: You spend less time sending and receiving data, and more time using it.

To us, it seemed like a better way. That's why we designed our Frame Relay network specifically around your needs. Ultimately, though, it's up to you: Bumper-to-bumper data. Or the fast lane. **1-800-736-1130**.

Sprint®

Not just another phone company.℠

© 1992 Sprint Communications Company L.P.

GLOBAL SERVICES

DOMESTIC AND INTERNATIONAL VOICE/DATA SERVICES, ACCESS EQUIPMENT AND REGULATORY ISSUES

Worth Noting

Less than 1% of LAN interconnection applications require network services with more than T-1 bandwidth, according to a recent survey of 267 users by CIMI Corp., a Voorhees, N.J., consultancy.

Regulatory Update

Crying foul over the Federal Communications Commission rules governing **AT&T**'s 800 services, the carrier is pressing the agency to apply the same rules to all carriers.

The FCC issued two orders requiring AT&T customers to change their 800 numbers if they want to purchase service packages that bundle 800 with other services and provide volume discounts.

The FCC said AT&T is dominant in 800 services with 80% of the market and that power could allow AT&T to unfairly leverage the sale of its other services. Also, since 800 numbers are not portable, users are unlikely to leave AT&T.

To prevent AT&T from tying up major chunks of 800 business in long-term deals before 800 numbers become portable next year, the FCC order also states Tariff 12 or customers signing service contracts will have the opportunity to abandon their custom deals with no penalty once 800 numbers are portable.

But AT&T said it has little ability to leverage sales of other services.

In November, AT&T filed a petition with the FCC asking it to apply bundling restrictions on 800 services to all carriers. The FCC has not acted on the request, and last week, AT&T turned up the heat by threatening court action if the agency does not act by Sept. 15. ◼

Users look to reap carrier access advantages

Number of private firms and carriers purchasing carrier-like switched access to local exchange switching facilities.

Quarter		Corporate purchasers	Carrier purchasers	Total
1990	March	46	466	512
	June	46	460	506
	September	49	462	511
	December	51	448	499
1991	March	59	446	505
	June	101	441	542
	September	83	455	538
	December	103	473	576
1992	March	113	482	595

Large companies with the traffic volume to justify purchasing carrier-like switched access to local exchange carriers – instead of paying for access as a component of standard services – can garner greater volume discounts and added service flexibility.

GRAPHIC BY SUSAN J. CHAMPENYSOURCE: FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON, D.C.

New Swiss law forces PTT to share CPE, data markets

Deregulation will allow competition, lower prices.

By Ellen Messmer
Washington Correspondent

BERN, Switzerland — Following in the footsteps of other European countries, the Swiss government has enacted sweeping regulatory changes to promote a more competitive market in network equipment and services.

The Swiss Telecommunications Law, enacted May 1, abolished the Swiss post, telegraph and telephone administration's monopoly control over the sale of customer premises equipment, creating a new equipment market overnight.

While leaving Swiss Telecom PTT's monopoly on voice intact, the law wrested away its hold on data transmission, opening up new markets such as videoconferencing, paging and outsourcing of data services.

Switzerland, while not a member of the European Community, has followed in the deregulatory steps of the EC's telecommunications directives to avoid isolating itself from a united Europe in the future.

Other EC nations have gone even further in the deregulation process. For instance, on May 27, Belgium restructured its telecommunications authority, Regie des Telegraphes et des Telephones, into a commercial company free of government involvement. The Swiss PTT, however, still remains a governmental body, a role defined by the country's constitution.

The intent of liberalization throughout Europe has been to introduce competition, which brings users more choices and better prices.

In Switzerland, the new demands of the telecommunications law have created an upheaval at Swiss Telecom, where, for the first time, it is reorganizing to face competition.

For example, Swiss Telecom has never set up customer account teams but plans to have an improved service organization in place by year end.

"We have to be more customer-oriented than before," said Karl Wuhrmann, the Swiss PTT's deputy general and head of telecommunications. "We have to address the customer and learn what he wants."

Wuhrmann noted that the new law means 15% of Swiss Telecom's approximate $5.1 billion in revenue will now be vulnerable to competitive inroads.

"We will lose market share — we had 100%. I need that market, or costs will keep rising," Wuhrmann said.

Although the law retains the current ban on transmission of third-party voice traffic over leased lines, the liberalization on data clears the way for outsourcing. This means companies such as BT's Syncordia Corp. and AT&T, which recently announced a European outsourcing venture, can now move in.

The new Swiss telecommunications environment also means

(continued on page 23)

Users, carriers clash over quality issue

Carriers mount effort to counter customer call for inclusion of service performance data in tariffs.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Carriers are attempting to foil user efforts to have network performance standards listed in tariffs, setting up a potentially bitter battle over service quality.

Rattled by several major network outages and a growing uneasiness that price cap regulation may be encouraging carriers to cut back on net maintenance and upgrades, users have begun to press regulators for assurances that service quality will not plunge. They believe performance standards in tariffs will provide a helpful benchmark.

In April, the International Communications Association (ICA) and the Consumer Federation of America (CFA) asked the Federal Communications Commission to force carriers to include service quality information in their tariffs.

From the carriers' first response to the request for tariffed standards, it was apparent the issue would pit users against telephone companies. All of the regional Bell holding companies, two major independent local carriers and MCI Communications Corp. criticized the users' effort.

The Tele-Communications Association, Inc. (TCA) and the Independent Data Communications Manufacturers Association, Inc., which represents manufacturers of equipment used by customers on their networks, both supported ICA and CFA.

Bell Atlantic labeled the ICA-CFA petition frivolous and urged the FCC to throw it out. The FCC considered but ultimately rejected including quality standards

(continued on page 23)

Strata Group to help Army update its telecom system

By Anita Taff
Washington Bureau Chief

ST. LOUIS — The U.S. Army has ordered six telephone management systems from Strata Group, located here, and may order 33 more as part of a telecommunications modernization project.

The Army will use Strata Group's Communications Control Center (C3) product to process directory assistance calls, set up a chargeback billing system, and track and manage telecommunications equipment and facilities at Army bases across the U.S. The Carlisle, Pa., Carlisle Barracks at the U.S. Army War College will be the first installation site for C3.

The Strata contract is part of a larger 10-year contract awarded to GTE Government Systems Corp. last year to modernize Army telecommunications systems, including equipment and services. The Army is upgrading its current systems — a hodgepodge of switching equipment — to Northern Telecom, Inc. MSL-100 private branch exchanges, according to Kathleen Layton, president of Strata Group.

C3 runs on a Unix-based platform and can interface with switches from Northern Telecom — and in the future AT&T — in order to retrieve call detail records and to automatically update calling feature changes. C3 has 16 software modules for functions including billing, call detail recording, fault monitoring and equipment inventory.

Layton said the Army contract is a strategic win for the firm in part because of its size and because it is one of the first major orders for the newly revamped version of C3, Version 4, which was released in May.

One of the most helpful features of the new C3 version, Layton said, is that it automatically updates all software modulesin the system when new data is entered. So, for example, if a customer adds information in

(continued on page 23)

Sprint to provide services

continued from page 9

lems was doing network development without corresponding CPE and application development. You've got a big problem; there's a mismatch," Canavan said.

In addition to researching equipment and software, Sprint will delve into the signaling needed to support high-speed data networks, he said.

Two research organizations will provide software expertise to Sprint for the trial — SRI International of Menlo Park, Calif., and Lawrence Berkeley Laboratory (LBL), the U.S. Department of Energy's national laboratory in Berkeley, Calif. SRI International will develop the imaging application, while LBL will develop the database for the trial.

The first phase of the DARPA trial will test point-to-point transmissions, with users accessing stored image files over the network, said Ira Richer, consulting engineer with Mitre Corp., which is managing the contract for DARPA.

The second phase of the trial will test ATM transmissions with users pulling up image data in real time as it is being processed on the supercomputer, he said.

Canavan added that he expects the imaging application to be running by the second quarter of 1993.

APPC/MVS fighting for respect

continued from page 9

only 2.7% had any LU 6.2-based applications and only 10.7% were planning pilot projects by the end of 1992. Of 100 sites looking to develop new applications, 63% were not committed to developing them to work with LU 6.2, IDC reported.

Still, some large software houses are behind APPC/MVS. Computer Associates International, Inc., Dun & Bradstreet Software, INTERSOLV and Sterling Software, Inc.'s Dylakor division all have products using APPC/MVS.

"We are using APPC/MVS to build client/server relationships with DB2," said Mike Gilpin, director of product management for application generation at INTERSOLV in Rockville, Md. INTERSOLV's APS product is a fourth-generation language cooperative processing code generator. "It is letting us build industrial-strength transaction processing applications."

Some users are showing interest, as well. One large Chicago-area Systems Network Architecture user who requested anonymity said his company is evaluating APPC/MVS but has not committed to it yet.

"We have all the VTAM and other LU 6.2 products in place, so we are interested," the user said. "Client/server applications are what we are looking for, and APPC/MVS looks like it should provide that support."

Vendor unveils access switch

continued from page 9

paths. Traffic from Ethernet LANs, point-to-point or multidrop SNA lines, X.25 packet assembler/disassemblers or other devices is combined and then forwarded to the network using any available bandwidth.

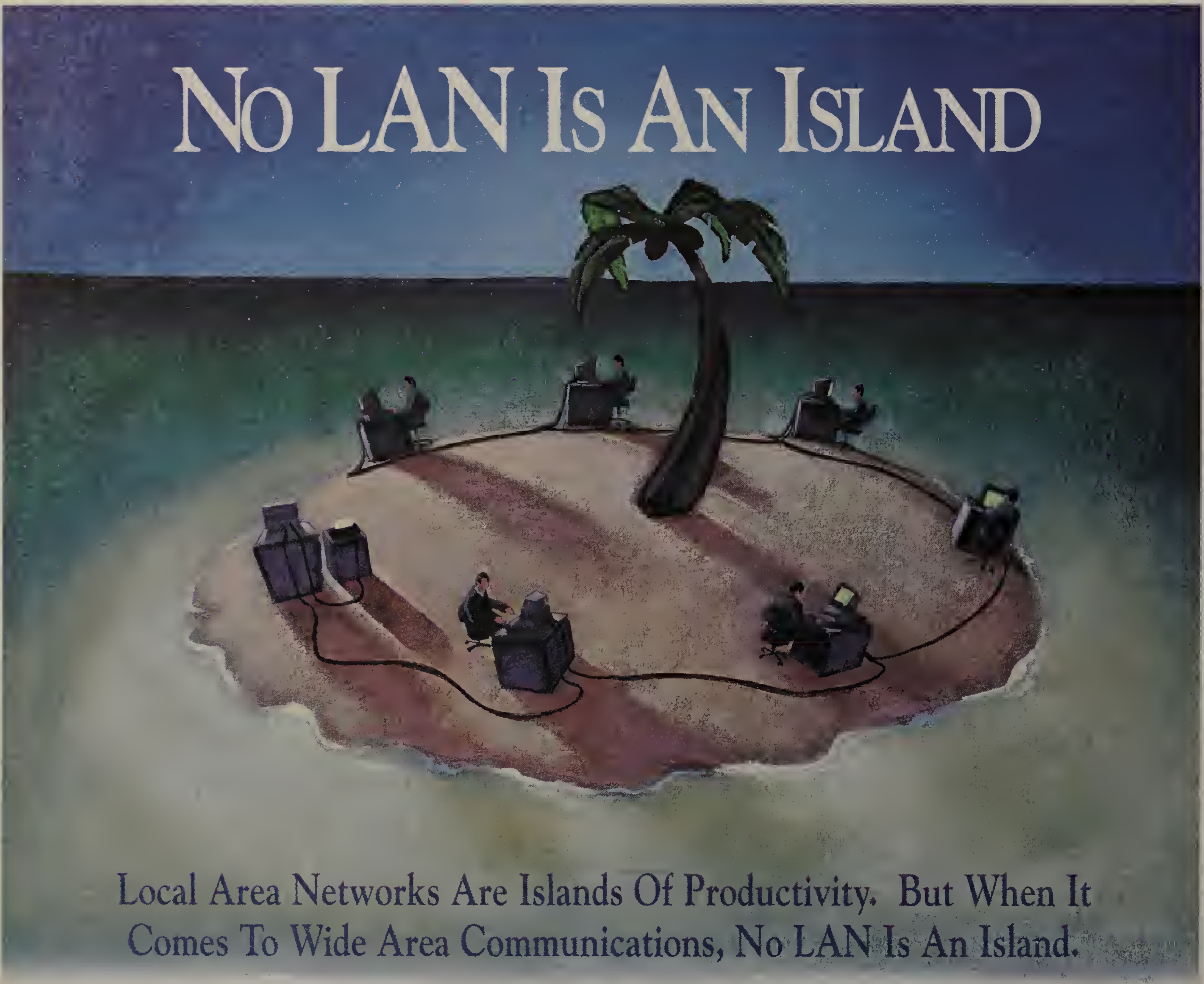
FrameMux also sends packets at guaranteed intervals, which minimizes transmission delay, Aljaff said.

Although it now routes only TCP/IP, FrameMux will support Xerox Corp.'s Xerox Network Systems and Novell, Inc.'s Internetwork Packet Exchange (IPX) protocols in the future. FrameMux also offers automatic rerouting of circuits around network faults and distributed network administration.

Frame Relay Technologies is positioning FrameMux as a router, but analysts said the device is more than that.

"It's not just a router with frame relay support. You can use it for more than just LANs," said Kathryn Korostoff, principal consultant at Strategic Networks Consulting, Inc. in Rockland, Mass. FrameMux can also concentrate lines from IBM controllers and front-end processors, as well as X.25 PADs, Korostoff said.

FrameMux costs $9,230 and is available now. Two 64K bit/sec synchronous ports are $1,250 apiece. Another Ethernet port, priced at $1,150, can be added to the base configuration.


NO LAN IS AN ISLAND
Local Area Networks Are Islands Of Productivity. But When It Comes To Wide Area Communications, No LAN Is An Island.

Out with the Old Way. In with the Gateway.

To enable your LAN users to communicate with the rest of the world, you can give them each a modem. That's the old way. And then there's the "Gateway". Gateways let your LAN users share modems. And the MultiComAsyncGateway allows more users to share fewer (and faster) modems.

More Users, Fewer Modems.
Higher Speed, Greater Efficiency.

The MultiComAsyncGateway incorporates high speed V.32 and V.32bis Multi-Tech modems and 57.6K bps serial ports, so your users tie up modems for shorter periods. Unlike some gateways that require dedicated dial-in or dial-out modems, the MultiComAsyncGateway lets your users dial in or out at will.

Make All of Your Users "Power Users"

The number to call: (800) 328-9717. Because no LAN is an island. And there's no better way to accomplish LAN-to-WAN connectivity than with Multi-Tech.

MultiTech Systems

Multi-Tech Systems, Inc., 2205 Woodale Drive
Mounds View, Minnesota 55112 U.S.A.
(612) 785-3500, (800) 328-9717, U.S. FAX (612) 785-9874
International Telex 4998372, International FAX (612) 331-3180

Circle Reader Service #111

Strata Group to help Army update system

continued from page 21

the service order module, the billing module automatically reflects that change.

"Most systems require the user to update each module," Layton said. "But if you have to update more than once, the odds that things will get out of sync are very high."

Another feature Layton says is unique to C3 is the ability to create a template of service features most often ordered by end users. The template eases the task of entering new orders by reducing the amount of information to be entered.

Strata is also in the process of signing a contract for C3 with the Department of the Treasury for the Internal Revenue Service. Strata will be a subcontractor to AT&T on that contract and will provide its C3 system to manage nine AT&T switches in three regions from a centralized location.

In addition, Strata is negotiating a contract with the Department of Energy and has already sold systems to the China Lake Navel Weapons Center. ◘

Swiss law forces PTT to share markets

continued from page 21

that users will no longer have to buy their private branch exchanges, modems, very small aperture terminals and other equipment from Swiss Telecom, the PTT's network operator.

The law does retain the traditional monopoly on infrastructure, assuring Swiss Telecom control of the exclusive right to install lines for at least the foreseeable future.

However, the PTT is not allowed to cross-subsidize equipment or newly deregulated services with earnings from monopoly services, said Peter Fischer, vice-director and head of the telecommunications division at the newly created regulatory body, Bundesamt fuer Kommunication (BAKOM), located in Biel, Switzerland.

Because the new law requires prices to reflect costs as much as possible, Swiss Telecom's international rates are expected to drop sharply, while Swiss local and long-distance rates will increase at least 15%.

(continued on page 33)

Users, carriers clash over quality issue

continued from page 21

in tariffs when it adopted price cap regulation, and nothing has happened to warrant a change at this time, Bell Atlantic claims.

Ameritech agreed that users have done nothing more than dust off an old argument that had previously failed. They have ample access to technical information from other sources, according to the carrier. "Sophisticated customers with specialized needs for information concerning technical standards of the companies' services have all the information they need in the technical publications themselves," the carrier told the FCC in a filing.

According to BellSouth Corp., quality standards in tariffs are unnecessary because the carrier is willing to provide such information on an individual basis to customers and has done so many times in the past.

Comments from Nynex Corp., Pacific Telesis Group, Southwestern Bell Corp. and US West, Inc., as well as United Telephone Companies, GTE Telephone Co. and MCI, mirrored these objections to tariffing service quality standards.

The TCA voiced strong support for the ICA-CFA petition but said it did not go far enough. The publication of network performance standards would help users identify carriers with unreasonably low standards, enhance the FCC's current service quality reporting requirements and help users conduct network planning, according to the TCA.

In addition to the information requested by the ICA and CFA, the TCA asked the FCC to require data on installation and repair intervals and error-free seconds for digital services. It also asked the FCC to require carriers to submit semiannual report cards showing how well actual performance conforms to the standards.

All of the user groups say that since local carriers have virtually no competition, such disclosures would be the only check users have on a carrier's service quality.

In their petition, the ICA and CFA asked the commission to require information disclosure on bit error rates, network availability, signal-to-noise ratios, call completion and postdial delay in tariffs. Such information would serve as an early warning system of deteriorating quality, the two groups said.

"Tariffed service quality standards would provide a user with the means to ensure that the LEC continues to provide the same quality of service it did when the user first accepted these circuits," the groups said. ◘

The Managing Enterprise Networks Conference

Boston
July 27-28, 1992

This comprehensive network management conference covers the newest developments and strategies for managing local-area networks, internetworks, and wide-area networks.

Conference Co-Chairmen:

Daniel D. Briere
President, TeleChoice, Inc.

L. David Passmore
Vice President, Gartner Group

The Issues

- Cost Justification for System/Network Management
- Managing Enterprise LANs
- Managing Distributed Systems and Remote LANs
- Managing the Enterprise – à la IBM
- SNMP Management
- Bandwidth and Transmission Management Options
- Managing Hybrid Public & Private Networks
- Integrated Network Management Platforms & Architectures
- Managing Frame Relay Networks
- Managing Global Networks
- People, Process & Organization

Special Seminar

- Evaluating Network Outsourcing Alternatives

Sponsored by:

DCI
Digital Consulting

NETWORK WORLD
The Newsweekly of User Networking Strategies

Exhibitors:

Ascom Timeplex, Inc.*
BellSouth Advanced Networks*
Bytex Corp.
Cabletron Systems, Inc.*
Cisco Systems, Inc.*
Comdisco Systems, Inc.
Comlink Network Services, Inc.
Connectivity, Inc.*
Digital Equipment Corp.*
Distributed Technologies Corp.
Hewlett-Packard*
International TeleManagement*
LANDA
Network General Corp.
Novell, Inc.*
ProTools Inc.*
Remedy Corp.
Telecommunications Techniques Corp.*
Vitalink Communications Corp.*
Wellfleet Communications, Inc.

*Conference Co-Sponsors

ADWYWN

Attendees:
Call (508) 470-3880 to receive a complete conference brochure.

Exhibitors:
Call Jean Desmaris at (508) 470-3870 to reserve your booth.

Say Good-bye To The Language Barrier.

Breakdown

A global computing event that unites, under one roof, today's connectivity experts for one targeted purpose — to pronounce that networking is the universal language of choice.

NetWorld 92

The United Nations Of Networking

NetWorld 92 is the talk of the connectivity industry. A cutting-edge exhibition of conferences and seminars where hardware and software developments are introduced, discussed and demonstrated. A conference that speaks the language of productivity and translates ideas into action.

Whether you communicate over LANs, WANs or wireless networks, or operate over diverse operating systems, NetWorld 92 is your primary venue for innovative products and services. Converse in many languages with industry-leading manufacturers and form a lasting connection that can translate into increased efficiency and sales.

Educational Seminars

A Universe Of Networking Possibilities

NetWorld 92 presents an encyclopedic display of intensive educational conferences and hands-on educational seminars on internetworking. Digest state-of-the-art terminology and processes that can propel your present networking plans forward, allowing you to expand software applications into new environments. And learn an unlimited vocabulary that will place you at the forefront of future strategies.

Improve Your Communication Skills

Don't isolate yourself and your company within the confines of yesterday's network architecture. NetWorld 92 lets you open the lines of communication, resulting in bottom-line benefits to your company.

For additional show information, contact Jodi Levine, Show Manager, at 201-346-1400 or Fax 201-346-1602.

NETWORLD 92 Dallas
The Universal Language

October 13-15, 1992
Dallas Convention Center

U.S. DEPARTMENT OF COMMERCE
U.S. AND FOREIGN COMMERCIAL SERVICE
INTERNATIONAL TRADE ADMINISTRATION

Foreign Buyer Program

Bruno Blenheim Inc. • Fort Lee Executive Park • One Executive Drive • Fort Lee, NJ 07024 • 201-346-1400 • 800 829-3976 • Fax: 201-346-1602

NetWorld Expositions in the U.S.A. and Europe are owned, produced and managed by Bruno Blenheim Inc. NetWorld is a servicemark of Novell, Inc. licensed exclusively in the U.S.A. and Europe to Bruno Blenheim Inc.

ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

Worth Noting

> "There still exists a Chinese wall between the widespread use of client/server applications in decision support and their rare use in full production center applications."
>
> **Tom Willmott**
> Vice-president
> Aberdeen Group, Inc.
> Boston

Store & Forward

Micro Data Base Systems, Inc. (MDBS) last week announced that MDBS IV, its client/server database management system, will be available as a Novell, Inc. NetWare Loadable Module (NLM).

The MDBS IV NLM version is expected to be available in the fourth quarter, with pricing starting at $7,000 based on configuration.

In a related announcement, **Solomon Software,** developer of the Solomon Accounting Series, based on the MDBS database engine, said it will incorporate the MDBS NLM version into its networked accounting software.

Hewlett-Packard Co. and **Sybase, Inc.** have announced that Sybase will use the HP 9000 Apollo Series 700 workstations and HP 9000 Series 800 business servers as an in-house software development platform.

Because Sybase will be able to test new features and functionality on the HP products and ensure their performance at every stage of the development cycle, users of both HP and Sybase products will benefit from this additional testing.

(continued on page 26)

Ingres to integrate DBMS with high-end applications

Supports multidimensional data, complex graphics.

By Timothy O'Brien
West Coast Bureau Chief

ALAMEDA, Calif. — Ingres, an ASK company, last week announced it will partner with TRW, Inc.'s ESL division in an effort to integrate its relational database management system with multidimensional, graphic-intensive applications.

To address the need to use SQL databases with systems such as geographic information systems (GIS) or medical imaging, Ingres and ESL will expand the object management capabilities of the Ingres Intelligent database to provide this multidimensional data support at the database kernel.

Ingres believes this level of integration was necessary to allow the effective storage, manipulation and retrieval of multidimensional data at acceptable performance levels and with flexible access to outside data sources.

"We saw that the only reliable and efficent way to add these new multidimensional data capabilities into the Ingres Intelligent database was from the inside out," said Dennis McGinn, president of Ingres. "That way, we can provide fast access to data."

Multidimensional data often includes physical characteristics such as height and weight, which can be represented in an image. In geographic applications, terms such as lines, points and areas represent various ways of displaying data graphically.

For instance, an application involving lines might be finding the quickest route for emergency vehicles or figuring out the best way to unclog city traffic.

Point-based applications might include finding the most strategic location for an oil well or the best site for a retail bank branch.

Finally, area-based applications might range from monitoring trends in high-crime neighborhoods to finding the best markets for hardware sales.

In addition to referencing geographical information in a GIS, multidimensional data can be used in areas such as weather forecasting, biotechnology, and computer-aided design and manufacturing applications.

Multidimensional data management capabilties are expected to be included in the Ingres Intelligent database by the fall of 1993. Z

Lotus offers its Realtime technology

NEW YORK — Lotus Development Corp. last week announced the availability of its Realtime Application Program Interface (API), which is designed to allow real-time financial market data to be integrated with a broad range of trading and investment management applications.

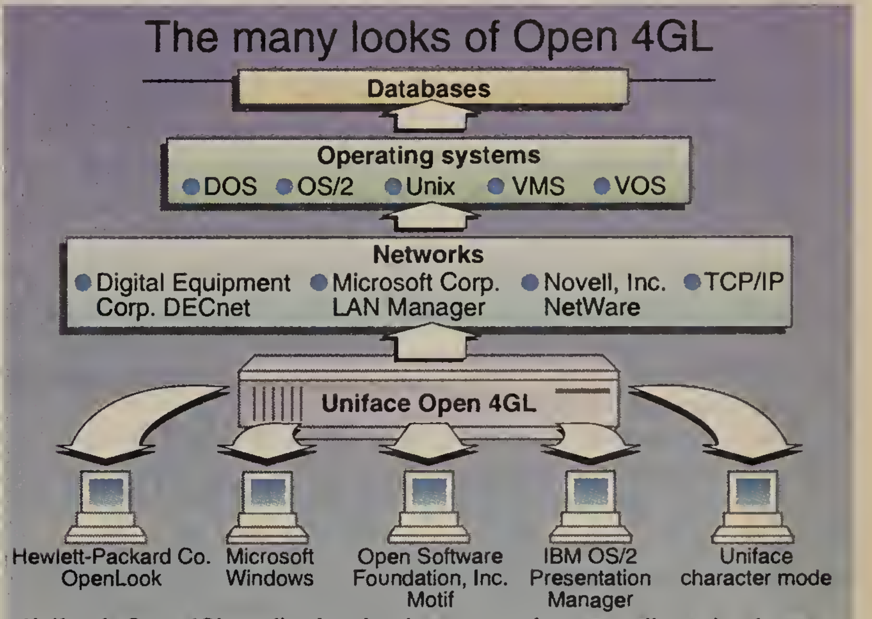
At the Securities Industry Association Show here, Lotus and other commercial software developers exhibited applications ranging from spreadsheets and graphics applications to custom-designed analytic applications and risk management systems, all linked to real-time data using the Lotus Realtime API.

By making its Realtime technology available to customers and applications developers, Lotus is providing a tool that connects virtually any application — whether it is graphics, analytics, decision support or work group applications such as Notes — via a single API to a wide variety of commercial and proprietary real-time data feeds and data distribution systems.

"In order to be an enterprise player, Lotus needs to move beyond its role as a provider of horizontal applications like spreadsheets or mail and address the specific needs of vertical markets," said Ann Palermo, research director for work group and messaging at International Data Corp. in Framingham, Mass. "Delivering its real-time product does just that for the brokerage industry."

The technology is based on Lotus' Realtime Engine, which accepts data from a feed server, caches it in memory and delivers

(continued on page 26)


The many looks of Open 4GL
Databases
Operating systems
● DOS ● OS/2 ● Unix ● VMS ● VOS
Networks
● Digital Equipment Corp. DECnet
● Microsoft Corp. LAN Manager
● Novell, Inc. NetWare
● TCP/IP
Uniface Open 4GL
Hewlett-Packard Co. OpenLook
Microsoft Windows
Open Software Foundation, Inc. Motif
IBM OS/2 Presentation Manager
Uniface character mode

Uniface's Open 4GL application development environment allows developers to build and maintain applications that are independent of networks, operating systems, databases and now graphical user interfaces.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: UNIFACE CORP., ALAMEDA, CALIF.

Development system supports many GUIs

Client/server programs created with tool can be used with graphical or character-mode interfaces.

By Timothy O'Brien
West Coast Bureau Chief

ALAMEDA, Calif. — Uniface Corp. announced a new version of its client/server software development system that enables applications to be used with multiple graphical and even character mode user interfaces without additional programming.

With the introduction of the Universal Presentation Interface (UPI) in the 5.2 release of Uniface's system, developers can create applications that work with Microsoft Corp.'s Windows, the Open Software Foundation, Inc.'s Motif, IBM's OS/2 Presentation Manager, Hewlett-Packard Co.'s Open Look and standard character-mode user interfaces.

Gaining independence

By providing cross-platform portability, Uniface is giving developers a way to build and maintain client/server applications that are independent of, but capable of working with, a variety of back-end database management systems, networks, operating systems and even graphical user interfaces (GUI).

"With the cross-platform approach offered through the UPI, users can avoid being stuck having to use a single GUI and, at the same time, can preserve the investment made in PCs that still use a character-mode display," said Anu Shulka, vice-president of marketing for Uniface.

The UPI is an important new component in the Uniface system, which includes forms-based application development software, database and network connectivity software as well as various report writer tools.

Client/server applications developed with the Uniface system can simultaneously retrieve data from heterogeneous back-end database servers on multiple networks. Uniface supports more than 25 back-end databases, including Oracle Corp.'s Oracle Server and Sybase, Inc.'s SQL Server, as well as the leading network operating systems such as Novell, Inc.'s NetWare.

Uniface is able to provide this simultaneous data access capability while automatically maintaining "interdatabase referential integrity" between the various DBMSs, meaning database rules for storing and retrieving data are enforced across the various systems.

Through the UPI, developers are provided with a full set of GUI objects such as scroll bars, push buttons, pop-up windows, check boxes, icons and pull-down menus that can be used to create a GUI for a Uniface application.

When the application is deployed over multiple GUIs, the UPI running on each client workstation acts like a translation util-

(continued on page 26)

System supports many GUIs

continued from page 25

ity using specific drivers to access the native GUI tool kit. In this way, the UPI can provide for the user all of the features, as well as the actual look and feel, of the various GUIs supported.

For example, with Microsoft Windows, features such as tool bars, cutting and pasting to a clipboard, the Multiple Document Interface, the Dynamic Data Exchange and the Print Manager are all supported through the UPI.

Less to learn

By using the UPI to create one interface for applications that can be used with all the leading GUIs, programmers no longer need to learn each GUI's tool kit. In addition, when other GUI drivers are added to the UPI later, users will not need to modify existing Uniface applications.

In order to accommodate the millions of character-based displays in use today, Uniface said it has provided support for character terminals without sacrificing any functionality or ease of use.

To aid application development, a graphical text editor and debugger are provided in the UPI and library facilities, making possible the reuse of GUI objects in new applications.

Analysts agreed that the Uniface solution provides many benefits to users.

"This announcement sounds promising," said Martin Palka, senior industry analyst with Dataquest, Inc., a research firm based in San Jose, Calif. "It hasn't been easy to provide interoperability among the various heterogeneous desktop environments, especially considering the large character-based population."

Other new features in Version 5.2 include major performance improvements based on enhanced memory usage and coding optimization, an end-user reporting facility, the support of user-defined data types, an application distribution facility that makes it easier to package and distribute applications, and support for the Japanese Kanji language.

Uniface, based here, is the U.S. subsidiary of parent corporation Uniface, B.V., based in Amsterdam. Uniface products, which were introduced in the U.S. in 1990, now boast worldwide annual revenues of approximately $42 million.

UPI drivers for Microsoft Windows, Motif, Open Look and character mode are available now. A UPI driver for OS/2 will be out in the third quarter.

Pricing for the Uniface development system ranges from $5,000 to $250,000, while pricing for the various GUI drivers ranges from $350 to $32,000, based on hardware platform and configuration. ◘

Lotus offers its technology

continued from page 25

it through the Lotus Realtime API directly to the application.

Software developers can connect their applications to the Lotus Realtime Engine using the Lotus Realtime API Toolkit, which consists of an application programmers' guide, sample files, header files and libraries.

The company also took advantage of the securities audience to announce two new versions of its real-time spreadsheet system: Lotus Realtime for Next, Inc.'s NeXTStep operating system, designed to work with Lotus Improv; and Lotus Realtime for IBM RISC System/6000 Workstations, designed to work with 1-2-3 for Unix.

In addition, Lotus announced an exclusive distribution agreement with Black Diamond Technologies, a newly formed division of a Chicago-based private options trading firm, O'Connor & Associates. Black Diamond Technologies will be the exclusive distributor of Lotus Realtime for NeXTStep.

Lotus Realtime is priced at $1,150 per user, which includes the ability to use Lotus Realtime to deliver data to multiple applications, including 1-2-3 and Improv. System requirements to run Lotus Realtime are 16M bytes of random-access memory and 16M bytes of disk space.

The Lotus Realtime API Toolkit is available for evaluation and testing to developers and software vendors building or porting applications for Lotus Realtime. It can be licensed from Lotus for an annual maintenance fee of $5,000 per site.

For information about Lotus Realtime or the Realtime API, call (212) 709-0508. ◘

Store & Forward

continued from page 25

Sybase also plans to use HP's high-end HP 9000 Series 800 symmetric multiprocessing business servers as the performance yardstick in benchmark testing of its relational database management system.

Information Builders, Inc. (IBI) has announced a new version of its Microsoft Corp. Windows-based object-oriented application development software that includes new data interfaces and performance enhancements.

Level5 Object 2.5 provides a wide range of capabilities, including all Windows facilities, object-oriented programming, expert system knowledge processing and the distributed data access of IBI's Enterprise Data Access/SQL 2.0. It also supports a full implementation of SQL, external program interfaces, triggers, stored procedures and interoperability with IBM's Information Warehouse Framework, its distributed data management strategy.

Level5 Object 2.5 is available now and costs $995 for a development system and $220 for a run-time system. Upgrades cost $145. ◘

Lower drive and media costs than optical.

Faster transfer rates than digital audio tape.

More sources of fully compatible products than both.

Expanding capacity with a standardized, compatible migrati

¼-inch Data Cartridge Tape Technology. The practical, reliabl

3M Magnus 1.0 and 1.35 data cartridges require a compatible drive. Archive, Maynard, Sankyo, Tandberg, Tecmar and Wangtek have introduced gigabyte ¼-inch drives. ©3M 1992.
Magnus is a trademark of 3M. 36USC 380

Circle Reader Service #109

Link notes

continued from page 19

second call when traffic levels drop.

Available now, the I-Gate Model-150 is priced at $4,795.

For more information, call (800) 423-9210.

Hughes Network Systems, Inc. has rolled out PCrouter, a card that transforms a standalone or local-area network-connected personal computer into a frame relay or X.25 router.

PCrouter is a two-port card that supports the Transmission Control Protocol/Internet Protocol, Novell, Inc.'s Internetwork Packet Exchange (IPX) and IBM's Network Basic I/O System.

It also supports X.25 and frame relay wide-area network interfaces at speeds up to 64K and 256K bit/sec, respectively.

The card works in IBM AT or compatible PCs, which do not have to be dedicated to the routing task.

It costs $2,695 and is available now.

For more information, contact Hughes at (301) 428-7113.

Optical Data Systems, Inc. (ODS) has enhanced its token-ring Simple Network Management Protocol net management software for its hubs with a Station List feature that identifies nodes on all rings by address and port.

Station List lets users identify each device using both its local-area network and port address, and supplies configuration information on the device to a central ODS SNMP-based net management console.

Station List, which is available now, will be offered as a free upgrade to existing ODS token-ring hub users.

The ODS Token-Ring SNMP Network Management software package with Station List costs $3,115.

For more information, contact ODS at (214) 234-6400.

Timeplex Federal Systems, Inc. announced that its Time/LAN 100 bridge/router has been successfully tested for interoperability with Blacker, which is the U.S. Department of Defense's new network security system.

Under the Blacker program, the Defense Department has developed a secure network communications protocol — dubbed Blacker-X.25 — and a network access device — called the Blacker Front End (BFE) — which uses encryption and other techniques to secure network data and restrict address access among network users.

The Defense Department has mandated that all computer systems linked to its planned backbone network must interface with the BFEs and support the Blacker-X.25 protocol. The Time/LAN 100 now provides both capabilities. ◪

Penril fills out bridge line

continued from page 19

ther link can be programmed to be active only during specified hours, such as during peak periods or at night, to support large file transfers when rates are cheaper.

Both the 1210 and 1220 support the Simple Network Management Protocol, Management Information Base (MIB) II and Penril's private MIB extensions, and can be managed locally or remotely from any third-party SNMP net management system.

Both products can also be managed locally from an asynchronous terminal for users without a dedicated network management station.

The 1210 is available now and costs $2,895, while the 1220, also available now, is priced at $3,195 with one WAN link and $5,395 with two WAN links. ◪

Dial-up finds new internet role

continued from page 19

according to John McConnell, vice-president and a principal at Infonetics Research, Inc. in Boulder, Colo.

Many of today's dial-up modems are equipped to support the CCITT V.42 error correction and data compression techniques, or other error correction protocols. V.32bis modems supporting V.42, for example, can achieve throughput of up to 57.6K bit/sec under optimal line conditions.

"The earlier problem with dial-up lines was that there were too many errors on the line, which effectively killed performance since you were forever retransmitting," McConnell said.

Redundancy

In addition to enabling remote sites with limited connection needs to communicate with the corporate internet, dial-up internetworking can also be used as a backup for leased 56K bit/sec lines in lieu of installing a second dedicated line to achieve redundancy.

Dial-up links can also be used for remote network management, such as in situations where the administrator is at home or where the administrator's network and the target network are not otherwise linked.

Support for switched digital links positions a router to support not only such high-speed services as switched 56K bit/sec links, but also inverse multiplexing.

McConnell said a number of router vendors are offering or plan to offer support for inverse multiplexing, which lets the router synchronize multiple switched digital calls to form a single, larger pool of bandwidth.

Such links could be used to back up a leased line in case of failure or to augment it during peak periods. ◪

n path.

proven choice. Now at 1.35 gigabytes...and growing.

No other backup media capacity is growing faster. Since 1989, ¼-inch Data Cartridge Technology has doubled, redoubled–and is about to quadruple to 10 gigabytes (and can double again with data compression), easily surpassing 4mm and 8mm capacity. And it's growing along a planned, compatible migration path.

See where gigabyte storage technology is going. Call 1-800-888-1889 ext. 26 and get your free copy of our 30-page guide.

Innovation working for you™

3M

Worldwide Sponsor 1992 Olympic Games

Before you "bet your business" on another dial modem...

STOP

Consider this:

PC
MAGAZINE
EDITORS'
CHOICE
March 17, 1992
AT&T Paradyne COMSPHERE 381

"If you have LAN-to-LAN, public information service, or other "bet-the-business" communications applications, this is the modem to buy."
--PC Magazine

AT&T Paradyne's COMSPHERE® 3800 Series dial modem family is now priced from **$795**. The COMSPHERE 3810 modem was winner of the 1992 PC Magazine Editors' Choice® Award. Good reasons to give the family serious consideration before you buy.

Consider quality. As *PC Magazine* put it, "the COMSPHERE worked for us every time over every line with every other modem."

Consider investment protection. Upgrades and enhancements can be downloaded over the telephone line--allowing you to quickly adapt your network to new business applications.

Finally, consider value. The **$795** price tag for the new COMSPHERE 3830 modem makes it the best V.32bis value on the market.

So if you're considering dial modems, we'll make it quick and easy for you. For more information on the award-winning COMSPHERE 3800 Series V.32bis family, call **800 482-3333, ext. 555**.
Or fax us at **813 530-2103**.

Visit us at ComNet West booth #854

AT&T Paradyne

PC MAGAZINE EDITORS' CHOICE LOGO, Copyright © 1985 Ziff Communications Company
PC MAGAZINE and PC MAGAZINE EDITORS' CHOICE are registered trademarks of Ziff Communications Company
COMSPHERE is a registered trademark of AT&T

Circle Reader Service #101

INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

Worth Noting

Fueled by the growing use of portable computers, the asynchronous communications software market will more than double from $193.1 million in 1991 to $467.4 million in 1996, according to a study by International Data Corp., a Framingham, Mass., market research firm.

People & Positions

The **International Telecommunications Satellite Organization** Board of Governors has elected **Len Dooley** of Australia as chairman and **Enzo Vitali** of Italy as vice-chairman. Both will serve one-year terms.

Dooley, who served as INTELSAT's vice-chairman last year, is manager of international facilities and organizations at AOTC, Ltd., the Australian signatory to INTELSAT. He replaces **M. Mulla** of Saudi Arabia. Vitali is manager of INTELSAT participation and extra-European systems for Telespazio, INTELSAT's Italian signatory.

Univel, a San Jose, Calif., joint venture of Novell, Inc. and Unix System Laboratories, Inc., has named **Arun Taneja** vice-president of marketing.

Taneja, who will report to Univel President and Chief Executive Officer Joel Appelbaum, will oversee product management and marketing as well as education. Previously, he was acting president and CEO at Vicom Visual Computing. He has also held marketing management positions at Data General Corp. and Sun Microsystems, Inc. ◘

Vendors unite to back PPP router-to-router protocol

By Bob Brown
Senior Editor

SUNNYVALE, Calif. — A group of 10 network equipment and software vendors has formed an interoperability testing consortium for products supporting the Point-to-Point Protocol (PPP).

PPP, which has been implemented by most major router vendors, is an Internet standard for router-to-router communications over asynchronous and synchronous links. Even though PPP is a standard, vendors' implementations of it differ slightly, which means one company's equipment may not be able to communicate with another's.

The PPP Consortium is designed to let vendors work out differences in PPP implementations to ensure that routers and related products can interoperate.

The consortium, the formation of which was spearheaded by Telebit Corp. here, also includes: 3Com Corp., Cayman Systems, Inc., Cisco Systems, Inc., FTP Software, Inc., Livingston Enterprises, Inc., Morning Star Technologies, Inc., Network Applications Technology, Inc., Network Systems Corp. and Novell, Inc.

The group completed its first interoperability tests early last month and will meet again here in October. The tests uncovered some minor discrepancies between PPP implementations but nothing that couldn't be fixed before the testing was finished, said Fritz Mueller, network product manager at Telebit.

Most of the vendors tested their synchronous implementations of PPP, as few vendors even offer asynchronous PPP support. Telebit, which sells a router

(continued on page 30)

Point-to-Point Protocol Consortium

3Com Corp.
Cayman Systems, Inc.
Cisco Systems, Inc.
FTP Software, Inc.
Livingston Enterprises, Inc.
Morning Star Technologies, Inc.
Network Applications Technology, Inc.
Network Systems Corp.
Novell, Inc.
Telebit Corp.

SOURCE: TELEBIT, SUNNYVALE, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

INDUSTRY BRIEFS

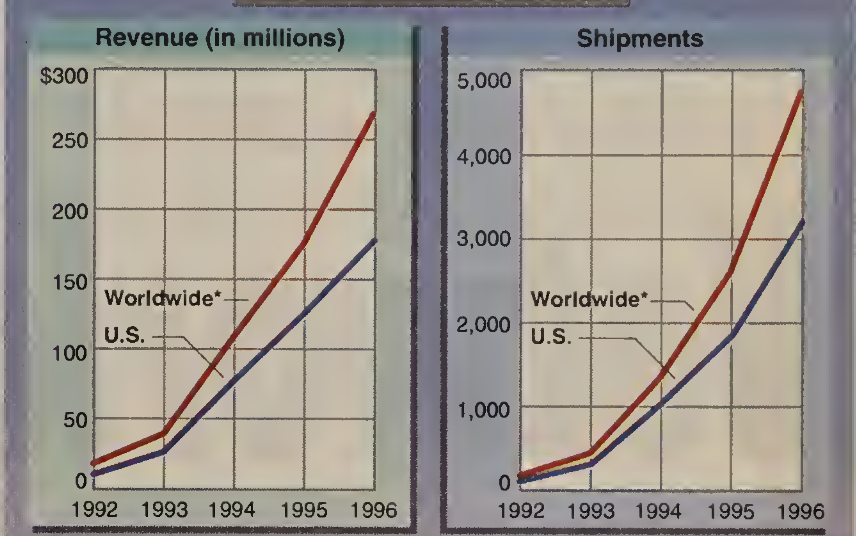
3Com boosts European support, reports financials. 3Com Corp. recently announced it has opened a 45-employee support center in Birmingham, England, to provide product training and technical support to its European subsidiaries, service partners and customers. The center is organized into four groups — European Technical Services, European Repair Services, European Design Services and the European Training Center.

The company also posted fourth-quarter and year-end results for the fiscal period ending May 31. Sales for the quarter were $121.7 million, up 31% from $92.8 million in the same quarter last year, while sales for the year were $408.4, up 2% from $398.5 million in 1991. Net income for the quarter was $4.9 million, up from $3.3 million in the fourth quarter of last year, while income for the year was $4.2 million, compared with a net loss of $27.7 million in fiscal 1991.

HP enhances telecom software. Hewlett-Packard Co. last week announced support for AT&T's Adjunct/Switch Applications Interface in its HP Applied Computerized Telephone software, which will allow HP 3000 and HP 9000 computers to connect to AT&T's Definity Generic 3 private branch exchanges in automated call center operations. Software vendor Borland International, Inc. plans to use AT&T's CallVisor software with its HP 3000 computer in the company's Scotts Valley, Calif., inbound call center. ◘

Zooming in on the videoconferencing market

MCU market projections



* Includes U.S.

Multipoint control unit is a device that allows video codecs at multiple sites to be linked into a single session.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: TELEMANAGEMENT RESOURCES INTERNATIONAL, INC., LAKE WYLIE, S.C.

BT offers complete videoconferencing

Vendor changes strategy by providing systems that come with codec, monitor, camera, cabinetry.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — BT North America, Inc. last week announced a new line of turnkey videoconferencing systems and a multipoint control unit (MCU) that can tie eight locations into one videoconferencing session.

The products mark the first time the company has offered fully packaged systems — consisting of its coder/decoder, as well as a monitor, camera and cabinetry — in the North American market.

The new BT VC5000 series includes four systems, each of which adhere to H.261, the international video codec standard that defines how images are compressed and decompressed for transmission. The BT North America codec should work with other vendors' H.261-compliant codecs, such as Compression Labs, Inc.'s (CLI) offering, which began shipping last week.

All four BT VC5000 models — the Compact VC 5110/5120, the Enhanced Compact VC 5130/5140, the Dual Monitor VC 5210/5220 and the Enhanced Dual Monitor VC 5230/5240 — operate at speeds ranging from 56K bit/sec to T-1.

According to Martha Hanlon, BT North America's director of application services and product marketing, the equipment is expected to ship in two months.

The Compact models, priced at $50,000 each, are designed for a videoconference with three people at each location. The enhanced version supports graphics and includes a movable camera instead of a fixed one.

The Dual Monitor models, priced at $65,000 each, come with two screens and can transmit pictures of three people and receive pictures of six. The side-by-side monitors allow conference participants and graphics to be viewed at the same time. The enhanced version has two movable cameras.

The systems support the National Television Standards Council standard for camera, screen and switching, rather than the Phase Alternate Line standard used in BT's European models.

New MCU

BT North America also introduced an MCU, the company's first such device to operate at rates between 56K bit/sec and T-1 speeds, rather than the 64K bit/sec to E-1 range common to Europe.

The BT VC 4100 MCU supports videoconferencing among H.261-compliant codecs and comes in a three-port or an eight-port model, priced at $72,000

(continued on page 30)

BT offers complete videoconferencing

continued from page 29

and $98,000, respectively.

Nigel Stevens, BT North America's videoconferencing product manager, said the MCU supports the draft international MCU standard, AV 231, which is expected to be ratified as a full CCITT standard early next year. Changes to the standard at this date are unlikely, but the vendor will make any adjustments required in the MCU to reflect the approved standard, Stevens said.

The new G.278 videoconferencing audio standard, approved as an international standard three weeks ago, will also be incorporated into the new BT North America videoconferencing models.

"These systems are future-proof," Stevens said.

Compatibility is key

Ken Bayley, general manager at BT Visual Services in London, pointed out that customers are now beginning to deploy more than one MCU in their networks. So interoperability between MCUs is likely to become a more important issue in the future.

Bayley said BT Visual Services is working with British Petroleum Company PLC (BP) to install the new MCU in three BP locations — one in the U.S. and two in Europe. Through a process called "arbitration," the three MCUs must be able to operate at a common data rate to work together, which is not an easy task with differing international speeds, Bayley emphasized. There is a loss of one port per MCU when MCUs work together.

Analysts said BT North America's announcement of its integrated systems indicates a shift in marketing strategy for the vendor.

Scott Douglas, marketing director with Telemanagement Resources International, Inc., a Lake Wylie, S.C.-based consultancy, said that until last week, BT only offered codecs manufactured by GPT Video Systems, Ltd. under a technology licensing agreement for the North American market.

Although BT has made custom-designed videoconferencing systems, such as the one recently announced for Lever Brothers Co., the company is now shifting its approach by offering packaged units, Douglas said.

"Basically, they've been selling piece parts in the past, but now they're selling integrated systems," he said. He noted that all the Japanese manufacturers are now offering integrated models, but industry leaders CLI and PictureTel Corp. do not favor marketing packaged systems.

Douglas said BT North America and its competitors have faced an uphill battle fighting for market share in the U.S. videoconferencing arena. Long-time players CLI and PictureTel, early developers of the technology, hold about 80% of the equipment market, which is estimated to total about $500 million per year. Douglas said BT North America will be joining less than half a dozen vendors in the market with a standards-based MCU.

Douglas noted that BT has been one of the strongest supporters of standards in the videoconferencing arena. He said users can take seriously the company's promise to quickly incorporate the results of standards efforts into its videoconferencing equipment. ◘

Network World: Most Useful Publication Three Years Running

Thanks to the prestigious International Communications Association (ICA) for choosing *Network World* once again as their most important and useful trade publication. This makes for the third consecutive time *Network World* has triumphed in this study which is conducted every two years by *The Wall Street Journal* and the ICA. What's more, we were chosen by a truly significant margin – 33% as compared to 22% for *Communications Week* and 21% for *Business Communication Review.*

Want to keep your products and services in the race? Call your *Network World* sales representative or Tom Wilson at 1·800·622·1108 today.

Source: *The Wall Street Journal*/ICA Member Study, Erdos & Morgan/MPG, 1992, 1990 and 1988.

Vendors unite to back PPP

continued from page 29

called NetBlazer, is among the few vendors with both asynchronous and synchronous support for PPP, according to Mueller.

Although PPP interoperability is not a pressing issue now, it will be in time. "Many companies still buy routers in matched pairs," Mueller said. "In a lot of cases, the installed base hasn't yet needed PPP because they've been using only one vendor's router."

As users begin to complement their router-based backbones with lower end routers in remote offices, that will start to change, Mueller said. Users might look to new vendors for these devices, he said.

Company mergers and network reconfigurations may also create the need to link different vendors' routers, he added.

Lawrence McDonald, a consulting telecommunications analyst at NCR Corp. in Miamisburg, Ohio, said NCR has had no problem passing packets via PPP from Telebit NetBlazers to NCR's own StarWAN Brouters, which are manufactured by Cisco. Still, McDonald said it is a good sign that the vendors are working together in the consortium.

"There's always the risk of misinterpreting the specification," McDonald said. "I really appreciate what the vendors are doing. It should make my life a lot easier." ◘

MANAGEMENT STRATEGIES

ENTERPRISE NETWORK STRATEGIES, USER GROUPS AND MANAGING PEOPLE AND TECHNOLOGY

Worth Noting

> "One of the biggest factors limiting development of client/server applications is the lack of people knowledgeable about client/server technologies."

Thomas Herring
Vice-president
Powersoft Corp.
Burlington, Mass.

Store & Forward

The **Electronic Data Interchange Association (EDIA)** will hold its 24th annual conference Oct. 5-7 at the Opryland Hotel in Nashville. The event will focus on the role of EDI in business reengineering.

The conference will have vendor exhibits as well as 44 educational sessions on topics ranging from basic and advanced EDI concepts to EDI issues in the government and the transportation industry.

The cost to attend the conference and exhibits is $475 for EDIA members and $550 for nonmembers. For more details, call (703) 838-8042.

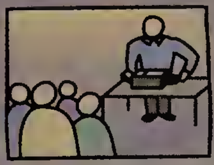
The **Electronic Mail Association (EMA)** will hold its annual conference Oct. 26-28 at the Fairmont Hotel in San Francisco.

The event will feature more than 25 educational sessions on topics ranging from wireless messaging to telecommuting. There will also be several preconference tutorials held on Oct. 24 and 25.

The conference costs $545 for EMA members and $745 for nonmembers. The tutorials cost $245 for EMA members and $295 for nonmembers. For more information, call (703) 875-8620.

Survey of Fortune 500 companies points to knowledge gap about FAX

Poll of 400 users reveals:



83% of Fortune 500 fax users not formally trained to use equipment.

67% of all fax transmissions sent long-distance, but only 1% sent at the most cost-effective time, which is in the evening.

36% of users said their fax machine had relay broadcasting, but only 14% said they had ever used the feature.

GRAPHIC BY SUSAN SLATER

SOURCE: GALLUP ORGANIZATION, PRINCETON, N.J.

Survey shows users not using fax to full potential

Better use of advanced features could lower costs.

By Ellen Messmer
Washington Correspondent

STRATFORD, Conn. — A recent survey about facsimile machine use at large companies in the U.S., Canada and Great Britain revealed that lack of user knowledge about the technology is leading to unnecessarily high operational costs.

Of the fax users polled for the survey, most said they had been given little equipment training and were unaware of features such as delayed and relay broadcasting, which can save telecommunications costs. The study found that two-thirds of the companies queried have no set policies for fax usage.

The survey was conducted earlier this year by the Princeton, N.J.-based Gallup Organization on behalf of Pitney Bowes, Inc.'s Facsimile Systems Division here, which sells fax machines. Gallup asked 400 daily users at Fortune 500 companies in the U.S. and 101 users at Canadian and British firms in the *Financial Times'* Top 1,000 companies how they used fax in their businesses.

Respondents in the U.S. said they received 50 documents a day, each averaging six pages, and sent 40 documents, each averaging five pages. In spite of heavy usage, few had fax machines that support multitasking, which allows fax machines to perform functions simultaneously.

Sixty-seven percent of all fax documents were sent long-distance, but only 1% of the Fortune 500 respondents said they used fax machines most during the evening when transmission costs are lowest. Fewer than half the users reported that their fax machines had delayed broadcasting, a feature that allows documents to be stored in memory for delivery at a preprogrammed time.

Of the 49% of users reporting they have the delayed broadcasting capability, only 21% had actually used the feature.

In addition, only 36% of the Fortune 500 respondents reported that their fax machines had relay broadcasting, which allows documents to be faxed to a hub and then relayed to multiple locations. Consolidation of faxed documents can reduce transmission costs. Of the users that did have relay broadcasting, only 14% had used the feature, the Gallup poll found.

According to Meredith Fischer, vice-president of marketing for the firm, the survey indicated a need for companies to develop policies defining fax usage and to train users.

Based on the poll, Pitney Bowes estimates that companies could save more than $3,000 per year in the cost of paper alone by switching from thermal paper, which costs about 7 cents per sheet, to plain paper, which costs a penny or less.

However, because thermal-paper fax units cost less — $1,700 to $2,100 — as opposed to plain-paper fax units, which cost $2,800 to $4,000, users have found it hard to justify a switch to plain-paper fax machines.

Fischer said she hopes the survey will spur companies to conduct their own internal analysis of fax usage.

MANAGING TECHNOLOGY

BY DAVID FERRIS

Work flow applications simplify office processes

Work flow applications are an important new class of software with which early users are just now beginning to experiment. Their experiences are clarifying where the technology should be used and its relationship to traditional data entry, storage and retrieval systems.

Work flow applications automate business processes that involve people working together. A simple example is that of expense request processing. An employee fills in a standard expense request form on a computer screen and sends it to the boss for approval by electronic mail. If the amount is over a certain figure, a copy is also automatically sent to the regional manager for independent approval.

When the necessary approvals are granted — by directly filling in the forms on the screen — the copies are sent to purchasing, where the last person in the process creates a purchase order, notifies the requester of the purchase order number and sends the purchase order to the supplier.

Note that conventional database applications also automate processes involving different people. A computerized order entry system, for example, will affect warehouse staff, truck drivers and so on, in addition to sales staff.

What makes work flow applications different from ordinary database applications? The key issue is the nature of the communications between the people involved. With work flow, typically:

- Requests arrive at unpredictable times.
- Requests do not take a lot of time to process. A given user might only spend one hour a week working in a work flow application.
- Processing is informal. Users don't schedule their time to handle requests but fit the task in with their existing work load.

Every business with more than 100 employees is full of unautomated work flow applications. In addition to expense request processing, other common examples are sales proposal management and tracking, sales lead distribution and tracking, engineering change requests and personnel information processing.

New York's Pace University is one of the early work flow adopters. Pace has added a work flow front end to one of its most important production database applications.

Pace is a private institution with 15,000 students spread over six locations. At a time when enrollments are shrinking throughout the higher educational system, Pace's ability to stimulate inquiries from pro-

(continued on page 33)

Major characteristics of work flow development tools

- Can move about various types of objects, such as forms, documents, spreadsheets, technical drawings, fax, photos and artwork.
- Information objects can be routed automatically from person to person according to programmed plan until processing is complete.
- Information can be processed at any point, and application developers have flexibility in the type of processing they specify.
- Tracking shows who has done what and where things are being held up. Tracking is a fundamental function, but implementations are often rudimentary.
- Information is typically passed using E-mail because it reflects the store-and-forward nature of work flow operations, is widely implemented and can contend with slow wide-area links.

SOURCE: FERRIS NETWORKS, SAN FRANCISCO
GRAPHIC BY SUSAN SLATER

NOW LAUNCHING THE FIRST TERMINAL SERVER FAST ENOUGH FOR PCs.

Our new DECserver™ 700 Ethernet Communications Server rockets past the competition. With 115.2 Kb/s line speed per port. That's two times faster than any other server.

In fact, it offers 215K characters per second aggregate throughput. Which means faster printing and quicker modem transfers. So your users spend more time working with data, rather than waiting for it.

You'll also be happy to know the DECserver 700 supports lots of popular protocols like LAT, Telnet and SNMP. Even SLIP, so your PC users can access your network wherever they are – on the road, at home or in the office.

What's more, the 700 works with all sorts of computers. From IBM to SUN, HP and others.

Even its memory is a marvel. Expanding all the way to 8 MB. So you can accommodate future protocols and applications. Not to mention protect your hardware investment.

All this for a price so competitive, it's bound to give you a boost.

So if you'd like to get up to speed on all the other great features of the DECserver 700, just call an authorized distributor or your local Digital sales office. Then prepare for blast-off.

digital™

DIGITAL. THE OPEN ADVANTAGE.

© DIGITAL EQUIPMENT CORPORATION, 1992. THE DIGITAL LOGO AND DECserver ARE TRADEMARKS OF DIGITAL EQUIPMENT CORPORATION.

AVAILABLE FROM THESE DIGITAL AUTHORIZED DISTRIBUTORS

Almac/Arrow Electronics	1-800-426-1410
Anixter Inc.	1-800-232-0190, ext. 376
Avnet Computer	1-800-426-7999
Cincinnati Bell Supply	513-579-8200
Computer Datacom	1-800-334-2020
Computer Systems Corporation	1-800-428-0714
Comsel Corporation	703-734-3880
Continental Resources Inc.	1-800-937-4688
Dartnell Enterprises Inc.	716-248-9400
The Datastore	609-722-8000
Datec Inc.	1-800-525-9905
French Gerleman	1-800-333-3122
Impact Marketing	1-800-345-1110
Inland Associates	1-800-888-7800
IOCS	1-800-451-1033
Kimbrough Computer Sales	303-425-0663
Midcom Communications	1-800-643-2664
MTI Systems Division/Arrow	1-800-645-6530
Pioneer Standard	1-800-874-6633
Pioneer Technologies	1-800-277-1693
Rawson & Company	713-688-8126
RJO Enterprises Inc.	301-731-3600
Systems Management America Corp.	804-627-9331
Total-Tec Systems	908-906-6500
Trilogic Corp.	1-800-346-2933
Wyle Laboratories	1-800-332-6995

digital™
AUTHORIZED DISTRIBUTOR

IS executives say top priority is responsiveness to users' requests

By Wayne Eckerson
Senior Editor

CAMBRIDGE, Mass. — Speed is of the essence when it comes to building computer and network systems, according to a survey of systems development directors.

The survey, which polled 162 systems development executives in North America and Europe, revealed that their top priority is to respond rapidly to end-user requests. It also showed that companies are implementing electronic data interchange more aggressively than any other advanced or new technology.

The survey was conducted by CSC Index, a market research and consulting firm based here that is owned by Computer Sciences Corp., a large systems integration provider. The companies surveyed represented a wide range of industries and had average annual revenues of $3.5 billion in North America and $2.7 billion in Europe.

"Delivering systems on time is what is most important [to systems development directors]," the report said. "This makes sense in today's competitive environment, where compressing cycle times and being first to market can give a firm a powerful competitive edge."

Other critical issues facing systems development directors, in order of importance, are increasing developer productivity; identifying and developing strategic information systems; developing an information architecture; dealing with maintenance, systems obsolescence and migration to new systems; and demonstrating the value of development projects to senior executives.

A similar survey of 54 European systems development directors revealed nearly identical results. The only differences were that European directors gave higher priority to the need to develop and implement metrics for systems development and achieving support for cross-functional systems.

"The 1992 results show a stable consensus developing in North America and European organizations about the issues that must be addressed," the report said, adding that systems development departments are in transition, gearing up to support radical organizational change and new ways of working.

"As they head into the mid-'90s, systems development departments find themselves at the center of making their companies — and themselves — faster, more efficient and more innovative. The systems development process is a key leverage point for achieving corporate competitive advantage. Hence, the priorities in systems development this year are speed, productivity and strategic systems."

Systems development groups have embraced EDI as a key new technology to foster business reengineering and speedier ways of doing business. More than two-thirds (69%) of those surveyed said their company had already implemented EDI, and 23% said they were researching EDI or initiating a pilot program. Surprisingly, only 40% of European firms reported having implemented EDI.

Work flow simplifies office processes

continued from page 31

spective students and then persuade them to enroll is obviously critical to its survival.

To stimulate student sign-ups, Pace built a prospecting and sales analysis system. It is a traditional storage and retrieval system implemented in Paradox, with loads of data entry and query screens and specialized reports.

According to Richard Levey, network manager at Pace, "All inquiries are logged. We then track everything that happens after that, right through until the lead becomes an enrollment." The information is used in many different ways, usually in report form. For example, Pace analyzes marketing programs for their effectiveness per dollar spent and enrollments to schedule instructors and classrooms.

To speed up requesting and receiving reports and simplify the process, Levey decided to build a work flow front end with BeyondMail. A total of 68 people use the system at six sites.

Every two weeks, the Paradox system generates a variety of reports, which are produced as print files and placed in a shared directory. To request one, users go into BeyondMail's E-mail system and select a form designed by Levey. The form lets the user specify which reports they want by checking off selection boxes.

Users then send the form to a mailbox called Reporter, which is read by a BeyondMail program, also written by Levey. Upon receiving the message, the program goes to the directory containing the print files and returns them to the user, again by E-mail.

Users also employ BeyondMail forms to request ad hoc reports, which require custom processing by Paradox. They fill in check boxes according to their requirements, selection criteria and required file format. The form is then sent to the Reporter mailbox which, like before, is read by a BeyondMail program. This boots Paradox, enters the report request through Paradox utilities, retrieves the report and sends it back to users.

There are major user benefits to the report-handling system:

- **Less information overload.** Each user doesn't have to be deluged with 20 reports produced twice a month.
- **Less user complexity.** When users need a standard or special report, they use a familiar tool — their E-mail package — to request the reports.
- **Less hassle.** When users need a report, they can generate it themselves.
- **Faster delivery.** Users get their reports within 20 minutes.
- **More reliable delivery.** Because no one else is involved, there's less chance that a report request is lost.

Although work flow applications are little-used today, ultimately they will be common. What systems should be automated first?

Look for existing manual systems that use multisection forms — forms with sections completed by different people or departments. These are great candidates for automation.

Next, look for manual systems where there's extensive use of multipart forms (the ones with lots of carbon copies in between the sheets) and where participants do their tasks only intermittently and at times that aren't easily scheduled.

Some areas to look at are:

- Ad hoc, important projects that require bits of information from lots of people.
- Report handling systems, similar to that of Pace.
- Front ends to production database systems, for users who only rarely access them. (This makes access very simple for them: They simply use a form built into their E-mail system.)

You'll probably find many candidates. To choose among them, check where you get the best return by speeding up the entire process, by being able to determine the process status quickly or by avoiding hold-ups due to a nonresponse.

David Ferris is the president of San Francisco-based Ferris Networks, which offers research reports, conferences, seminars and consulting on PC networking. This article is based on the company's research report, BeyondMail Update.

Swiss law forces PTT to share markets

continued from page 23

Swiss Telecom's largest customer, Union Bank of Switzerland (UBS), may not see cost benefits in the upcoming price shift but does expect service to improve under the new law, said Kurt Luescher, vice-president and head of the UBS Integrated Network (UBINET). "I wish that the PTT would be less of a technology shop and more oriented toward customer service," Luescher said.

UBS already permits a handful of brokerage houses to piggyback their data onto UBINET and is now considering whether to formally enter the outsourcing business.

While the new law makes heavy demands on the Swiss PTT, it may also contain an advantage for the carrier that could benefit users. The law appears to allow the PTT to offer discount prices for the first time to customers when packaging net transmission and management services together — somewhat like AT&T's Tariff 12, with which Swiss PTT officials are quite familiar.

"It means we can design, to a large extent, the technical properties of the network and put a price on it which is not the public tariff for it," said Max Schaeren, division chief of the networks directorate in the nonvoice systems division. According to Schaeren, the law will let the carrier offer discounted, customized services not allowed in the past.

END-USER SUPPORT

BY DOUGLAS WELCH

Users themselves can be a good support resource

Network managers and technicians today are inclined to assume end users are computer-illiterate mutton heads with no interest in the local-area network except when it's not working. Not only is such thinking obviously divisive, it's highly arrogant.

Adding to such thinking are the complaints many LAN support teams air about the endless demands placed on them. Yet these support teams overlook the fact that some users want to learn about the network and, thus, ignore one way to provide the support: Let users support themselves.

Finding users capable of providing technical support is easy; they're the people who ask the most questions. Even though these employees can seem to be a nuisance because they ask so many questions, they are the very people that LAN managers should make their allies.

When the right users are found, given the appropriate training and treated as partners, they can become the best evangelists any LAN support staff ever had. Users have an insider's view of what happens in their department and have a deep understanding of their area of business. Trained users can diagnose and explain problems quickly and clearly when they report them to the network group. Every LAN manager knows that one knowledgeable person on the other end of the phone is better than making ten trips to an off-site building to help someone hit the return key.

> Circle the wagons, pass out the rifles, and let the users help keep the wolves at bay.
>
> ▲▲▲

The network group should cultivate these user allies, keeping them well fed on a diet of high-quality, timely information. Make sure information about new procedures and network changes quickly get into the hands of these users. Likewise, the first people to be notified of a network outage should be your user allies. Let them know what's going on so that they can help put emergency plans into effect. Circle the wagons, pass out the rifles, and let the users help keep the wolves at bay.

User allies should also have access to all the support information the network group has at its disposal. If the users are interested, convince their managers to let them take network training classes. Increased productivity and limited downtime are strong persuaders in the budget wars, and department managers might see the training as an investment to ensure that their department doesn't suffer when a network problem occurs.

Once you have enlisted the aid of user allies, it is important to make sure that their managers understand the importance of what they do. Without management support, user allies will be caught between their normal jobs and the help they provide to you. An understanding between network and other managers will ensure that there is a clear understanding of allies' duties and responsibilities.

Maybe LAN groups don't need to draft end users into LAN support positions, but they should definitely recruit users to assist them in their support role. A large group of informed users just might be the way to stem the LAN support crisis. ◪

Welch is a support analyst for a major entertainment corporation in Los Angeles.

NETWORK WORLD

Editor
John Gallant

Executive Editor
John Dix

Assistant Managing Editor — News
Paul Desmond

Senior Editors
Bob Brown — Industry Update
Jim Duffy — Data Net Architectures
Wayne Eckerson — Management Strategies
Bob Wallace — Global Services

Michael Cooney — Data Net Architectures
14701 Bentley Square
Centreville, VA 22020
Phone: (703) 830-8138
Fax: (703) 830-7963

Caryn Gillooly — Local Networking
5423 Gladewright Drive
Centreville, Va. 22020
Phone: (703) 266-1537
Fax: (703) 266-1543

Senior Writers
Joanne Cummings — Internetworks
Maureen Molloy — Internetworks

Staff Writer
Skip MacAskill — Internetworks

West Coast Bureau
Timothy O'Brien
Bureau Chief/Enterprise Applications
Phone: (415) 771-3530

Margie Wylie
Senior Editor/Local Networking
2088 Union Street, Suite 2
San Francisco, Calif. 94123
Phone: (415) 771-4103
Fax: (415) 771-2817

Washington D.C. Bureau
Anita Taff
Bureau Chief/Global Services
Phone: (202) 879-6744

Ellen Messmer — Industry Correspondent
National Place
1331 Pennsylvania Ave. NW, Suite 505
Washington, D.C. 20004
Phone: (202) 879-6752

Features Editor
Charles Bruno

Managing Editor — Features
Jim Brown

Associate Features Editors
Susan Collins
Alison Conliffe

Design Editors
Susan Champeny
Susan Slater

Assistant Managing Editor — Production
Beth Khoury

Associate Editor
Michelle Beaulieu

Copy Editors
Karen Moltenbrey
Monica Sambataro

Assistant to the Editor
Cheryl Tynan

Editorial Assistant
Glenna Fasold

Contributing Editors
Daniel Briere
James Kobielus
Alan Pearce

Teletoons
Phil Frank
Joe Troise

President/Publisher
Colin B. Ungaro

Director of Financial Operations
Mary Fanning

Network World
161 Worcester Road
Framingham, Mass. 01701
(508) 875-6400
MCI Mail — 390-4868
Fax: (508) 820-3467
R.A.F. hot line:
(800) 622-1108, Ext. 487

USER ADVISORY PANEL

Laurie Bride
Manager, Communications Technology,
Boeing Computer Services
Roy Bruce
Senior Adviser, International Communications Association
Manager of Voice Communications, The Coca Cola Co.
Byron Comp
President, Association of Banyan Users International
Senior Technology Specialist, Marshalls, Inc.
Phillip Evans
Senior Advisor, International Communications Association
Telecommunications Consultant, Perot Systems Corp.
Len Evenchik
Director of Communications,
The Commonwealth of Massachusetts
Thomas Festa
Communications Director, Liberty Brokerage, Inc.
Lionel Gillerman
Telecommunications Services, McDonnell Douglas
Aerospace Information Services Co.
Vice-President for Regulatory Affairs,
Tele-Communications Association, Inc.
Robert Hamilton
Information Technology Engineer, Hewlett-Packard Co.
President, Tele-Communications Association, Inc.
E.W. Bud Huber
Senior Consultant, Hughes Aircraft Co.
Chairman, User Alliance for Open Systems
Michael Kaminski
Manager, CIM/Networking Technologies
General Motors Corp.
Michael Kilbane
President, International Communications Association
General Manager of Systems Development,
Diamond Shamrock R&M, Inc.
Ron Kopitowsky
Telecommunications Director, Metropolitan
Transportation Authority of New York State
First Past President
Communications Managers Association
Charles Murray
President, Communications Managers Association
Telecommunications Director, The Travelers Insurance Co
Chuck Papageorgiou
Network Administrator, United Parcel Service, Inc.
Henry Pfendt
Director, Information Technology Services,
Eastman Kodak Co.
William Pomeroy
Director of Telecommunications Public Policy,
International Communications Association
Richard Sidoll
Telecommunications Director, Morgan Stanley
Laura Swanton
President, NetWare Users International
Hughes LAN Systems, Inc.
Jane Videtich
President, ICA Systems
Systems Development Manager,
R.J. Reynolds Tobacco Co.
Stanley Weiland
Manager, Corporate Telecommunications
General Electric Co.
Ronald West
President, Association of Data Communications Users
Manager of Telecommunications and Office Automation,
Shearman & Sterling

EDITORIAL

Commitment, not just support, needed for open systems

"There's a difference between supporting something and being committed to it. A chicken supports the bacon-and-egg breakfast. The pig is committed to it."

That comment, made by a speaker at the Comdex/Spring '92 conference in Chicago, provided a humorous introduction to a discussion on vendor support for open standards.

Unfortunately, it highlights a real problem. Too many vendors *and users* are talking about supporting open systems, but few seem really committed to making them a reality.

Case in point: A recent *Network World* Reader Advocacy Force article discussed the problems users face in achieving interoperability among local-area network operating systems. Today, it's extremely difficult for a user on one LAN to share files or peripherals, or exchange messages with a user on another.

While LAN vendors espouse the gospel of interoperability and promote intricate architectures for achieving it, their comments make clear that interoperability decisions are based more on business gain than on customer need. But vendors are vendors. Their motive is profit, and they live or die depending on whether they expand and retain their customer bases.

Users are another story. Too many companies are not committed to making buying decisions based on how well a vendor supports de facto and actual interoperability standards.

Sure, users will make a checklist and ask the vendor whether it intends to support X, Y and Z standards sometime in the future. But how often is a user's make-or-break purchase decision based on open systems support? How many users even check to make sure vendors follow through on their earlier open systems commitments?

Interoperability will make life easier for users, giving them more application flexibility and leverage with vendors. But it will evolve slowly as long as users are unwilling to vote for interoperability with their dollars.

To paraphrase Clint Eastwood, "You gotta ask yourself, am I committed to open systems today?" ◪

THE FUTURE OF NETWORKING

BY JAMES HERMAN

Superworkstations will change networking irrevocably

Just as personal computers completely changed computing and networking, the next generation of inexpensive workstations will fundamentally change computing architectures, as well as local- and wide-area networks.

Specifically, workstations and servers based on new chips, such as Digital Equipment Corp.'s Alpha and Intel Corp.'s 586, will make distributed computing the norm. These powerful devices will also drive mainframes to extinction, usher in the broadband networking era and dramatically accelerate the movement to open systems.

Earlier this year, DEC announced its new 64-bit Alpha Reduced Instruction Set Computing (RISC) processor, claiming that Alpha workstations will hit peak performance of 400 million instructions per second (MIPS) with sustained performance of 150 MIPS. Contrast this with the 320 MIPS of a top-of-the-line IBM mainframe. And DEC plans to produce Alpha-based workstations and servers priced as low as $20,000.

Texas Instruments, Inc. and Hewlett-Packard Co. intend to exceed Alpha's performance figures with RISC processors that will ship before year end. More important for the mass market, Intel is designing its 586 Complex Instruction Set Computing (CISC) processor to deliver 100 MIPS. Intel's 80386 chip offers only about 5 MIPS, while its 80486 delivers about 20 MIPS.

When they hit the market next year, 586-based workstations and servers will be priced as low as $7,000. Over a three-year period, the cost of a CISC- or RISC-based machine offering 100 or more MIPS is likely to fall to about $3,000.

These processors will be the basis for superworkstations that require supernetworks. The jump from the 15-MIPS workstations of today to 150-MIPS superworkstations will be accompanied by a jump from 10M bit/sec Ethernet to 150M bit/sec cell relay networks.

Fast servers will be able to handle a greater number of users and transactions, so faster networks will be needed. Superworkstations will promote the use of multimedia user interfaces, which include voice, image and video. With these new interfaces, users will generate at least 10 times more network traffic than they do with today's simple graphical user interfaces.

> Superworkstations are about to assault present-day PCs and PC LANs.
>
> ▲▲▲

With such speed, these superworkstations will be able to emulate older PCs and still deliver increased performance. Running older DOS server applications in emulation mode on a superworkstation shouldn't be a problem because they will be backwards-compatible with older machines.

Very fast machines will make it increasingly easy to justify moving applications off mainframes and onto client/server nets. Users will find it less expensive to rewrite mainframe applications than to pay software maintenance fees and spend millions of dollars to expand mainframe capacity.

Until recently, it was easy to say PC LANs couldn't handle the work load of enterprise applications. It will no longer be possible to say that when superworkstations are available.

It is even possible that superworkstations will prompt users and application developers to turn away from the proprietary and difficult-to-scale client/server platforms of Novell, Inc.'s NetWare, Microsoft Corp.'s LAN Manager and Banyan Systems, Inc.'s VINES, and embrace distributed computing environments, such as the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE) and Unix International, Inc.'s Atlas.

Features such as full-fledged distributed file systems, standards-based directory systems and network-based authentication make distributed computing environments superior to first-generation client/server network operating systems.

Superworkstations running DCE and object-oriented applications will be extremely compelling, especially to firms seeking to develop a new generation of enterprise applications that support new ways of doing business. Fast, flexible and highly productive, they will capture the attention of developers throughout the industry.

Superworkstations and distributed computing are about to assault present-day PCs and PC LANs. When the assault is over, computing paradigms will have shifted, distributed computing will be mainstream, broadband LANs and WANs will be growing quickly and mainframes will be on their last legs.

Anyone want to buy a used 80486-based PC? ◼

Herman is a vice-president with Boston-based Northeast Consulting Resources, Inc., a consulting firm that focuses on managing long-term change in technology-based enterprises.

TELETOONS

BY FRANK AND TROISE

The results of your survey of users' needs are in: 76% need a vacation home. 14% need childcare and 10% need to leave early today.
NETWORK MANAGER
Phil Frank

LETTERS

Difficulties of going global

I must take issue with a few points made in an article on international private lines that accompanied your recent Buyer's Guide to digital private-line services ("Buying on the commodity market," *NW,* June 15). I strongly disagree with the comment, "Communications managers buying international private lines face almost the same concerns as those buying domestic lines."

While it is true that users' concerns for high reliability are common to both domestic and international networks, ensuring diversity and redundancy on international networks is much more complex when two or more carriers are involved.

Users should also be aware that simply having alternate international fiber-optic facilities, such as Trans-Atlantic Telecommunications-8 and Private Trans-Atlantic Telecommunications-1 (PTAT), does not always ensure network diversity. Most U.S. carriers that own capacity on these transatlantic systems carry the traffic from the cable-head landing point (typically located along the New Jersey coast) to New York.

Last September, many telecommunications managers sat idle for hours as a New York Telephone Co. failure brought down their entire transatlantic networks.

Other users, however, had prepared for such a crisis. Many of Sprint Corp.'s private-line customers took advantage of PTAT's ability to route traffic to Europe directly out of an alternate cable head located near Philadelphia, thus completely bypassing the New York area.

In addition, the article

(continued on page 48)

"OPINION ULTIMATELY GOVERNS THE WORLD," Woodrow Wilson once said. Does opinion govern your network, too? If so, consider writing an opinion column for *Network World.*

Columns should be 600 words long and submitted on disk, via modem or through MCI Mail at 390-4868.

If you'd like to write a column, call Alison Conliffe, associate features editor, at (508) 820-7416 or fax your idea to us at (508) 820-3467.

Do you disagree with an article you've read in Network World? *Write us a letter about it.*

Hard copy should be typed, double spaced and mailed to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701 or faxed to (508) 820-3467. If you prefer, letters can be sent via MCI Mail at 390-4868 or uploaded to our Bulletin Board System. (See page 2 for BBS instructions.)*

Letters may be edited for space and clarity.

Serving up small slices

One year later, Apple and IBM deliver few of the promised Macintosh-to-IBM integration products.

By KIMBERLY PATCH

Should Apple Computer, Inc. and IBM host a party on the one-year anniversary of agreeing to ally, invited users may wonder what the celebration is all about since few products that link Macintoshes and IBM systems will be decorating the cake.

In fact, users have received only a small portion of the Macintosh-to-IBM integration products the firms are planning to develop. IBM has also served up a 300-page blueprint detailing how to integrate Macintoshes into its Systems Network Architecture nets.

But looking on the bright side, users can expect a greater number of products to become available in the next 18 months. Even more products currently on the drawing board that are not listed as part of the initial alliance could start hitting users' plates next year.

The development of products that integrate Macintoshes into IBM systems and networks is just one part of the far-reaching alliance, which was finalized last October. In the longer range, Apple and IBM will work with Motorola, Inc. to build a new Reduced Instruction Set Computing-based workstation. IBM and Apple will also develop Unix- and object-oriented operating systems as well as multimedia application software (see "The strategy of Apple and IBM's longer range plans," page 39).

Delivery of the first few integration products is an immediate boon to users looking to link Macintoshes to IBM hosts or Token-Ring local-area networks. Some users are eagerly awaiting the next round of networking products, due out later this year, that will tightly integrate Macintoshes with Application System/400 minicomputers.

Other users, however, say waiting for the next round of products is risky because the offerings may be stale by the time they can be put to use. For that reason, some users may opt for comparable products developed by third parties.

The future product that may be of most interest to users is software that will add support for IBM's Advanced Peer-to-Peer Networking (APPN) to the Macintosh. Development of the software is a high priority and is tentatively scheduled to be served up late next year, according to Michael Fury, IBM's project officer for the Apple-IBM enterprise networking alliance. The product will enable the Macintosh to act as an end node in an APPN network and thus freely communicate with any other APPN end node.

Under their agreement, Apple and IBM have also pledged to deliver products that will enable users to manage Macintoshes using IBM's LAN Network Manager and NetView network management software but provided no release dates.

The duo is also considering the development of several other products, which were not spelled out in the alliance agreement, Fury says.

Although he would not provide further details, Fury says these products include an implementation of AppleTalk for IBM's Unix-based AIX operating system, software that will allow Macintoshes to access IBM CICS-based on-line transaction processing applications and a product that will enable Macintoshes to act as a client to servers running OS/2's Database Manager and Communications Manager components.

What's being served up

Products that can already be put to use include an enhanced version of Apple's SNA•ps, which links Macintoshes to IBM hosts via IBM's 3270 data stream or Advanced Program-to-Program Communications LU 6.2 protocols. Apple has also used IBM's Token-Ring chipset to produce its $999 Token Ring 4/16 NB Card, an adapter that connects Macintoshes to 4M or 16M bit/sec token-ring LANs.

Three more products are scheduled to ship by year end. Although not yet named, this batch includes software that will add the native AppleTalk network protocol stack to OS/2-based personal computers, an IBM 5250 terminal-emulation package for the Macintosh and a version of Apple's Data Access Language (DAL) software for IBM's AS/400.

AppleTalk for OS/2 will enable Macintoshes to act as a client to OS/2-based servers. Because these servers also support DOS-based PCs, AppleTalk for OS/2 will enable Macintoshes to communicate with DOS-based PCs.

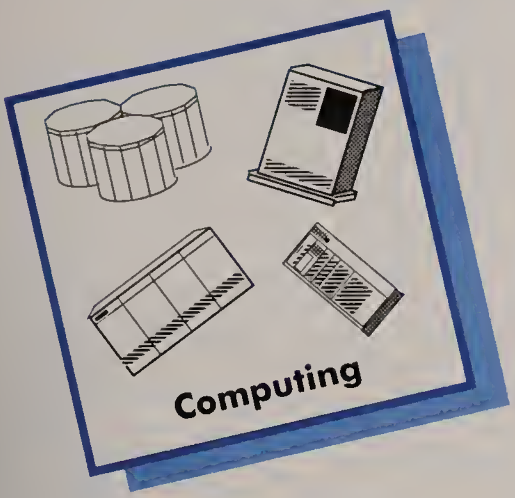
The 5250-emulation software will enable Macintoshes to run IBM AS/400-based applications in a window on the Macintosh screen. Adding DAL to the AS/400 will enable the AS/400 to act as a database server for DAL-based applications running on Macintoshes. DAL enables Macintosh applications to transparently extract data stored in SQL databases on the AS/400 and converts the data from AS/400 format to Macintosh format for display on the Macintosh.

Two other products, PC Support (PCS) and a Macintosh version of IBM's Common Programming Interface for Communications (CPI-C), are slated to be rolled out in 1993.

ILLUSTRATION ©1992 ANDREA JENNISON

An Introductory Offer From NETWORK WORLD

Available for DOS, Windows and Macintosh Applications

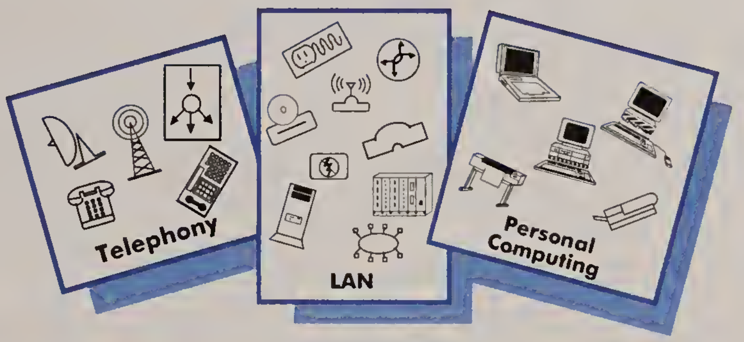


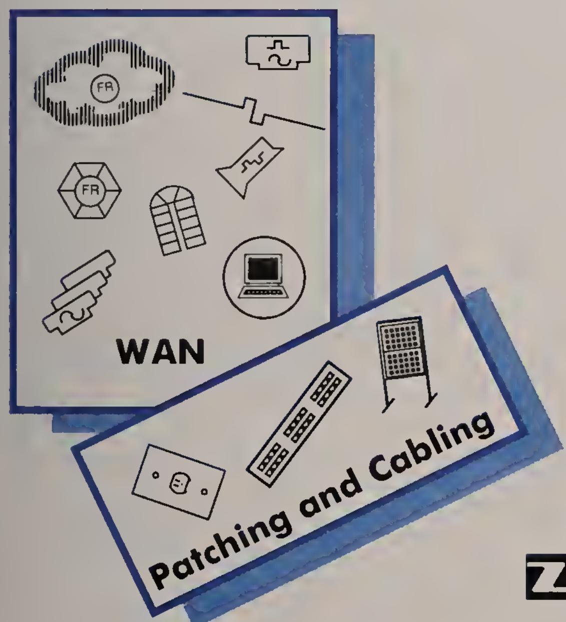
Because In Your Job, A Picture Is Worth Much More Than 1,000 Words.

Let your networks speak for you loud and clear with *Network World's* NetDraw™, the first clip art library created exclusively for networking professionals.

With over 170 professionally drawn objects, NetDraw gives users immediate access to symbols for WANs like modems and multiplexers and LANs like bridges, routers and servers – just to name a few. Symbols for computing, PCs, telephony and patching and cabling are also provided to make your networks complete – with just the right amount of detail.

- Add clarity and consistency to network drawings
- Make drawing modifications, network redesigns, and topology changes quickly and easily
- Add a professional look to proposals, bids and training materials
- Eliminate the hours spent creating "home grown" symbols





NetDraw is available in Macintosh, DOS and Windows versions and is designed to work with almost all popular drawing, graphics, word processing, page layout and presentation programs. It is an extremely powerful productivity tool yet is simple to use.

NetDraw is available at the low introductory price of just $99.95. Ask about multiple copy discounts.

Make your network documents speak for you loud and clear! Call or use the form below to order your copy of NetDraw today!

Clip Art for Building Networks ™

NetDraw

Call
800-643-4668
To Order Today!

Call 800-756-9430
To Have Our
Brochure and
Sample Page
Automatically
Faxed Back To You

To order NetDraw, fill out the form below completely and fax to 508-879-3167 or mail to NetDraw, c/o Network World Inc., 161 Worcester Road, Framingham, MA 01701.

If you'd like more information on the product, call 800-643-4668 or fill out top portion of card and drop in the mail.

Name ______
Title ______
Company ______
Address ______
City ______ State ______ Zip Code ______
Tel ______ Fax ______

Method of Payment
— Number of copies at $99.95 (plus state sales tax if applicable and $4.95 for shipping and handling)

☐ Visa ☐ MasterCard
Account Number ______
Signature ______
Expiration Date ______

☐ Check Enclosed (add s+h and state sales tax if applicable)
Make check payable to Network World, Inc.

Please indicate appropriate version:
☐ MAC ☐ Windows ☐ DOS

Price/availability subject to change. 30-day guarantee conditions: shipping/handling not refundable, product must be in original condition. Seal must not be opened on software. All trademarks and tradenames are properties of their respective owners. Allow 4-6 weeks for delivery.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 866 FRAMINGHAM, MA

POSTAGE WILL BE PAID BY ADDRESSEE

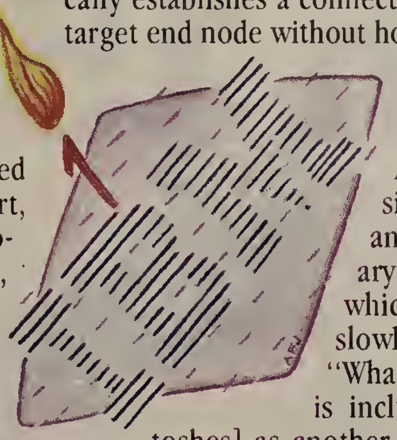
NetDraw
c/o Network World, Inc.
The Meadows
161 Worcester Road
Framingham, MA 01701-9525

PCS will enable Macintoshes to act as clients when attached to AS/400 servers. PCS goes beyond terminal emulation to enable Macintosh-based applications to transparently access the services of AS/400s, such as file storage and printing. Macintosh support for CPI-C will allow developers to write Macintosh-based applications that can run on IBM networks.

According to IBM and Apple officials, product development is essentially on schedule, despite shifting priorities that have changed the order in which products will be released.

Since October, Fury says, the companies have juggled the networking products' priorities in order to serve up those that connect Macintoshes to AS/400s as quickly as possible, which officials say is important to users. Native AppleTalk on IBM machines and APPN connectivity are also strong networking priorities. This juggling has pushed back delivery of CPI-C for the Macintosh.

The need for products that link Macintoshes to IBM systems and networks stems from the growing acceptance of Macintoshes in the business world. In 1991, there were 5.1 million Macintoshes installed worldwide, according to Barry Gilbert, director for the LAN service at Infocorp, a market research firm in Acton, Mass. About 66% of those Macintoshes are networked, and 25% coexist with PCs on IBM networks, he says.



"Virtually every IBM site has some Macintoshes," Gilbert says. "The ratio is one Macintosh for every 10 to 12 PCs."

According to Tom Nolle, president of CIMI Corp., a market research and consulting firm in Voorhees, N.J., about 63% of all Macintoshes are at IBM sites and about half of those are networked.

Tightening the tight tie

While it's important to link Macintoshes to existing IBM systems and networks, the tight integration will occur when IBM systems support native AppleTalk and Macintoshes play a role in APPN. By including AppleTalk in IBM products and APPN end-node software in Macintoshes, users can support AppleTalk within APPN networks, rather than building parallel networks.

Just like it's encapsulating Transmission Control Protocol/Internet Protocol in SNA and eventually APPN, IBM will encapsulate AppleTalk in APPN, Nolle says.

APPN and the Apple-IBM alliance are really "fruits of the same seed," he adds. "The planning center of gravity has shifted toward the desktop."

APPN end-node software for the Macintosh will provide directory and routing services lacking in SNA•ps' APPC support. Analysts say these added capabilities will help Macintoshes take on a role in IBM's strategic shift from SNA to APPN. APPN releases users from the traditional hierarchical networking scheme of SNA, where all connections between network devices must be authorized by a mainframe.

APPN is more dynamic than APPC. Although APPC provides peer-to-peer links between network nodes, a network manager must first define the network paths that will be used to establish APPC links. Those definitions are stored in host-based VTAM and front-end processor-based Network Control Program software, which together are responsible for establishing links in SNA networks.

With APPN, end nodes are connected tò network nodes, which act as routers. When an end node wants to communicate with another end node, it passes the request to a network node that consults a directory to locate the target end node. The network node then dynamically establishes a connection with the target end node without host intervention.

IBM's Fury says APPN is designed to be an evolutionary strategy to which users will slowly migrate. "What we've done is include [Macintoshes] as another platform in APPN networks," Fury says. The Macintosh as an APPN end node is aimed at broadening APPN's acceptance, he adds.

IBM's shift to APPN is a reaction to the proliferation of LANs that have left IBM's mainframes out of the picture, according to Nolle. Users are "walking away from SNA connectivity by developing interdepartmental, internet-connected networks in a way which doesn't involve mainframes," he says.

In a funny way, APPN helps IBM keep mainframes part of users' multivendor corporate networks by removing the constraints inherent in networking mainframes using SNA. Mainframes can hang off an APPN network in the same way a PC does, rather than acting as a central traffic cop, Nolle says.

Likewise, Macintoshes, the onetime commercial sector outsider and desktop renegade, will soon be able to do what many never thought possible — act as a peer to its long-established desktop rival, the PC.

User reaction

Users realize the potential the Apple-IBM alliance holds, but many complain the firms are slow in developing the products they need.

According to Phillip Gordon, information center manager for Charles Schwab & Company, Inc., a San Francisco brokerage firm, the Apple-IBM products' projected delivery dates are too far off. With 400 Macintoshes and 2,200 PCs on an IBM network, Gordon says he cannot wait around for products in today's competitive market.

"My unvarnished opinion is there are a lot of nice ideas out there, but there are a lot of nice ideas everywhere," Gordon says. "What we need are ideas [and products] now. The Apple-IBM alliance is not offering that."

Consequently, Gordon uses Novell, Inc.'s NetWare to enable Macintoshes and PCs on a token-ring LAN to exchange files. "I have a Novell LAN where Macintoshes and PCs are coexisting just fine," he says. "We're exchanging files. We're even sharing printers."

Some of the announced Apple-IBM products parallel third-party counterparts that are already shipping. In addition, because of long lead times, projected Apple-IBM products that do not have counterparts on the market today are likely to have competition by the time they go to market. Some users say they are likely to use the products that are available first.

Matt Ball, a senior analyst at Acu-Sport Corp., a guns and ammunition wholesaler in Bellefontaine, Ohio, has plans to connect a stand-alone Macintosh LAN to an AS/400 with a terminal-emulation program to enable end users to access a database on the AS/400.

But Ball said he may not wait for the Apple-IBM 5250 terminal-emulation product because it is possible to make the connection with third-party products that are available now. For instance, he is considering the purchase of Andrew Corp.'s TokenAxcess-Client, which enables Macintoshes to emulate 5250 terminals.

Ball adds that he has no plans to add any services beyond terminal emulation. "Right now, users just want to use Macintoshes as 5250 terminals."

Another user already has TokenAxcess-Client in place because the Apple-IBM 5250-emulation product was not ready. The television station division of NBC uses the product to connect 50 Macintoshes to an AS/400 via a NetWare LAN. The company is happy with the results, says Joe Harris, director

(continued on page 38)

Apple and IBM ties

IBM's vision	How the Mac will fit into IBM nets		
IBM's enterprise networking blueprint	**Products Macs will use to support blueprint**	**Primary developer**	**Availability**
Management: •SNA Management Services •SNMP •Common Management Information Protocol	•IBM Network Management for the Mac	To be determined	Unannounced
Applications and application support: •Common Programming Interface for Communications •Transaction processing •Remote procedure call •MQI •CICS	•SNA•ps (APPC support for the Mac) •Data Access Language for AS/400 •Macintosh PC Support •Macintosh CICS client support •Macintosh OS/2 Database Manager client support •Macintosh OS/2 Communications Manager client support	Apple Apple Apple Apple Unannounced* Unannounced*	Now 3Q 1993 Unannounced Unannounced Unannounced
Multiprotocol networking: •SNA •APPN •OSI •TCP/IP •NETBIOS •IPX	•Macintosh APPN end node •Macintosh 5250 terminal emulation •AppleTalk for OS/2 •AppleTalk for AIX	Apple, IBM Apple IBM Unannounced*	Late 1993 4Q 3Q Unannounced
Subnetworking: •Token Ring •Ethernet •FDDI •X.25 •Frame relay •Cell/packet-switching	•Token Ring 4/16 NB Card	Apple	Now

*Development of these products is under consideration.

SOURCE: APPLE COMPUTER, INC., CUPERTINO, CALIF., AND IBM, ARMONK,N.Y.

(continued from page 37)

of information technology at NBC.

Harris, who oversees the computer systems at six NBC-owned television stations, said the Macintoshes are being used in a pilot project to make it easier for end users to extract data from the AS/400. Currently, most end users access AS/400 data using DOS- and Microsoft Corp. Windows-based PCs, both of which Harris says are more difficult to use than Macintoshes.

The 50 Macintoshes are able to access one local and five remote AS/400s. Apple's SNA•ps is used to enable local Macintoshes to access remote AS/400s.

Macintosh users simply double-click on a Macintosh screen icon to begin an AS/400 session, Harris says. "The Macintosh user doesn't know anything other than it's a window on a Macintosh." He also says that users can easily cut data from the AS/400 application and paste it into a Macintosh application.

In addition to accessing AS/400 data, TokenAxcess-Client enables Macintosh users to access a 3270 terminal-emulation program running on AS/400s and, therefore, IBM mainframe data.

> The Apple-IBM alliance was, for Apple, a step away from DEC.
>
> ▲▲▲

NBC is also trying out a product made by Connectivite Corp. of Tarrytown, N.Y., that makes the 5250-emulation screen look more like a Macintosh application. Harris says he is pleased with the way Macintoshes fit into the IBM environment, but on his wish list is a feature that will allow users to print AS/400 data on an Apple laser printer. Both the Apple-IBM 5250-emulation product and future versions of the TokenAxcess-Client product are slated to include Apple printer support.

On the other hand, Joe Manger, director of MIS at Bixby Medical Center in Adrian, Mich., says Macintoshes on the facility's small stand-alone network used for desktop publishing are likely to be replaced by PCs because they are easier to integrate with the center's AS/400.

In addition, users who have large PC LANs and only a few Macintosh LANs say the Macintosh's needs may play second fiddle to the PC's.

Charles Schwab's Gordon says that although he plans to continue supporting both PCs and Macintoshes, he is not willing to spend as much on Macintosh networking products as he is on PC networking products. "There are going to be a lot of [Macintosh] users who will be upset with this, but you can't spend as much per station [if Macintoshes are only] 10% of your stations," he says.

Upstaging Apple-DEC?

Despite a predictably slow start, the Apple-IBM alliance looks considerably stronger than the agreement Apple signed with Digital Equipment Corp. in 1988.

Apple and DEC essentially agreed to resell products already available. The Apple-DEC alliance made products easier to order, but it lacked new architectural changes in networking to make Apple and DEC product integration easier.

The software included file- and print-sharing software based on products from Alisa Systems, Inc., DEC's Local Area Transport terminal-to-host protocol and VT-220 terminal emulation for Macintoshes. DEC still counts the Macintosh as a strategic desktop platform, but the two companies are not working very closely anymore. In fact, the Apple-IBM alliance was, for Apple, a step away from DEC.

Still, DEC produced Pathworks for Macintosh, software that ties Macintoshes into DECnet networks and enables them to share files, printers and electronic mail with DECnet devices.

CIMI's Nolle points out that IBM's strength has traditionally been long-term planning. "Sometimes looking at the horizon has caused them to fall into every hole along the way, but when they get their act together, they can be formidable," he says.

Although the Apple-DEC deal soon fizzled into a few small products, the candles on the Apple-IBM cake seem destined to last longer. Apple and IBM have sunk more money into more complicated projects, and several of their promised networking products represent new connections rather than reruns of third-party products.

But ultimately, the question of just how formidable the Apple-IBM alliance — and APPN — will be involves waiting at least until the two companies ship a few more of the products they keep talking about. Only then will users be able to have some cake and eat it, too. ◘

RAM Mobile Data an

What? Find a cus
in a green Buick b
leaves in 15 minu

National Car Rental® Thanks to RAM Mobile Data's revolutionary wireless data communications service, missing briefcases and the cars they're left in can now be found instantly. That's why National Car Rental uses RAM's mobile data service to track over 120,000 vehicles, improve vehicle maintenance management, provide better customer service, and cut costs.

Like what you hear? Then let us show you how mobile data can transform your company. With a laptop or portable computer and RAM's wireless, radio-based network, your field personnel can place orders, initiate billing, and check inventory whenever, wherever they need to. The RAM service will give your employees the ability to send and receive messages instantaneously – no matter where they are.

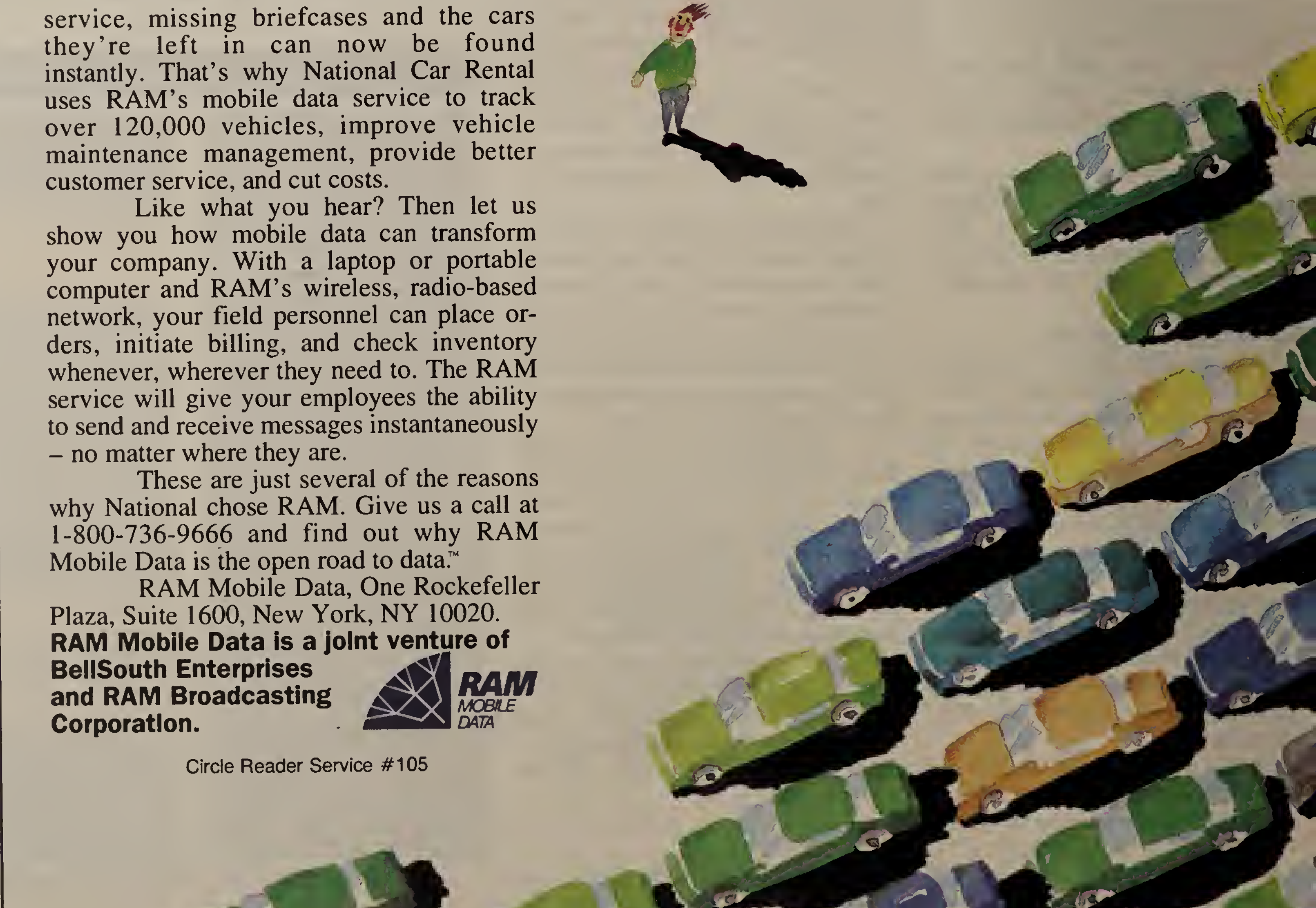
These are just several of the reasons why National chose RAM. Give us a call at 1-800-736-9666 and find out why RAM Mobile Data is the open road to data.™

RAM Mobile Data, One Rockefeller Plaza, Suite 1600, New York, NY 10020.

RAM Mobile Data is a joint venture of BellSouth Enterprises and RAM Broadcasting Corporation.

RAM MOBILE DATA

Circle Reader Service #105



Looking at the strategy of IBM and Apple's longer range plans

As part of their far-reaching alliance, Apple Computer, Inc. and IBM are jointly developing a new computer and several software products that will play a large role in their long-term strategies.

But users will likely not see fruit from this part of the alliance for several years. Because it will take so long to build the products, neither firm is providing detailed information about these joint development projects.

However, the projects are strategic moves aimed to better position IBM as a supporter of multivendor environments and to boost Apple's presence in commercial environments.

But the firms have outlined broad goals for this part of their alliance. Of primary importance is development of a Reduced Instruction Set Computing (RISC)-based workstation. Apple and IBM will also work to develop a Unix-based operating system and have formed joint ventures aimed at developing an object-oriented operating system and software standards that support multimedia application development.

The workstation will be built using a new RISC chip called the PowerPC, which IBM is developing with the aid of Motorola, Inc. The PowerPC will be a one-chip version of an IBM-designed RISC chip used in IBM's RISC System/6000 workstation.

The PowerPC chip will be used by Apple to develop a diverse line of PowerPC-based computers designed to easily fit into IBM networks. IBM will also develop products based on the PowerPC chip.

IBM opened a design center and started work on the chip last fall, according to an IBM spokesman.

PowerPC-based workstations will run the PowerOpen operating system, a scaled-back version of IBM's Unix-based AIX.

Apple and IBM have also created two software development firms, Taligent, Inc. and Kaleida, Inc. Taligent will build the object-oriented operating system, while Kaleida is responsible for developing multimedia software standards.

IBM

Long-range goals

What's being developed	Developers	Target dates
PowerPC chip	IBM and Motorola, Inc. developing PowerPC chip. Apple and IBM will each implement the chip in new systems	1993
PowerOpen operating system based on AIX	Joint effort by IBM and Apple	1993
Multimedia standards	Joint-venture company called Kaleida, Inc.	First elements as early as the end of this year
Object-oriented software	Joint-venture company called Taligent, Inc.	Mid-1990s

GRAPHIC BY SUSAN SLATER
SOURCE: APPLE COMPUTER, INC., CUPERTINO, CALIF., AND IBM, ARMONK, N.Y.

Taligent has hired all the major officials it needs and opened its doors on March 2, says Loretta Stagnitto, director of marketing communications. The new firm combines the work Apple was doing with its Project Pink and the work IBM was doing with its Patriot partners project.

Taligent is "doing an analysis of the product, defining the product, doing market segmentation studies and outlining the business plan," Stagnitto says. The firm's products will include an object-oriented operating environment and a developers kit. Developers will use the kit to more quickly and easily write object-oriented applications.

Kaleida is still in the hiring stages, according to an IBM spokesman. While the venture may eventually produce some consumer products, its main mission is to create standards such as scripting and data formats programmers can use in building multimedia applications. Using Kaleida's standards, programmers will be able to build applications that mix multiple sources of information.

Although Kaleida's work is long-term, the firm may produce its first standards as early as the end of this year, the spokesman said.

— Kimberly Patch

National Car Rental

tomer's briefcase
efore his plane
tes?

Send For Free Info

NW July 92

For more information on any of the products and services advertised in *Network World's ActionCenter*, circle the Reader Service Numbers on this coupon which correspond to the advertisements of interest to you.

Complete the coupon information and mail to: ***Network World***
P.O. Box 5090, Pittsfield, MA 01203

Name ______________________
Title ______________________
Company ______________________
Phone (   ) ______________________
Street ______________________
City ______________________
State ______________ Zip ______________

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56

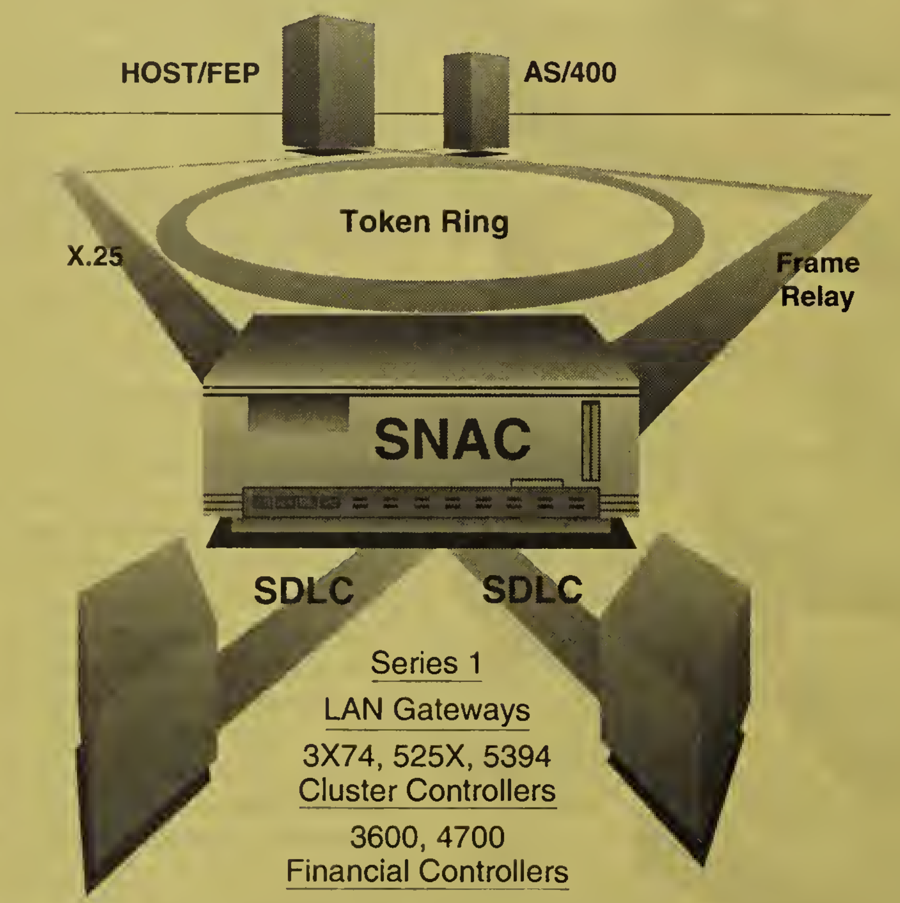
NW July 92

Expires 10/31/92

ACCESS CONTROLLERS

SDLC to Token Ring? SDLC to Frame Relay? SDLC to X.25?

YES!



Sync Research brings new life to SNA by giving you access to today's high-speed networks: X.25, Token Ring and Frame Relay. Sync's line of SNA Network Access Controllers (SNACs) is the broadest range of internetworking solutions on the market. Field proven and available **now**.

Save money, improve network performance, maintain centralized NetView management with the SNAC family of internetworking systems from the **industry leader.**

800-ASK-SYNC

Sync Research, Inc. 7 Studebaker
Irvine, CA 92718 • 714-588-2070

SYNC RESEARCH
InterNetworking SNA

Circle Reader Service No. **15**

SWITCHING/PATCHING/TEST EQUIPMENT

Finally...All the tech control functions in one package!

For any datacom manager, controlling a modern network is not a simple task. He has a mixture of digital and analog devices communicating at various speeds, on various protocols, and connected through an unusual variety of interfaces. To further complicate the issue, some equipment has been there forever and some has just been installed. Nevertheless, the network must be effectively managed to continue operation and maintain availability as close to 100% as possible.

The Series 2000 IntelliSwitch Control System is designed to work in just such an environment, regardless of how large your network is. Now, you can switch, back up, patch, monitor and alarm, test access, report on network performance, and control external test equipment on any interface and on any speed or protocol, with a single system and uniquely managed by a central control unit.

HP OpenView™ management, redundant power supplies, superior integration, and a great price make this product the ultimate tool for tech control and a great help to the datacom manager.

™ HP and OpenView are registered trademarks of Hewlett-Packard Company.

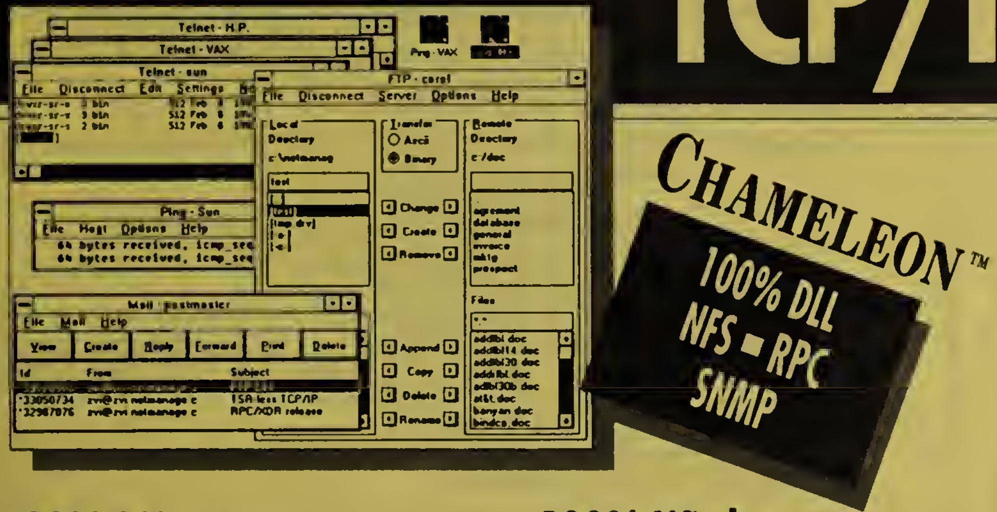
HADAX ELECTRONICS
Designed and Built Smart – a Hadax Tradition

11 Teaneck Road • Ridgefield Park, NJ 07660
(201) 807-1155 • Fax: (201) 807-1782

Circle Reader Service No. **16**

TCP/IP NETWORKING

TCP/IP for Windows



100% DLL
Implemented as a Windows DLL
(not a TSR) using only 6K base memory

100% Windows
Point-and-click user interface,
cut-and-paste, on-line help

Applications:
TELNET (VT100, 220), FTP
SMTP/Mail, Statistics, PING
BIND, TFTP, Custom

Developer Tools:
- Berkeley 4.3BSD socket
- DLLs (TCP/IP, FTP, SMTP)
- ONC RPC/XDR
- SNMP API

NEW! **NFS Client & Server**

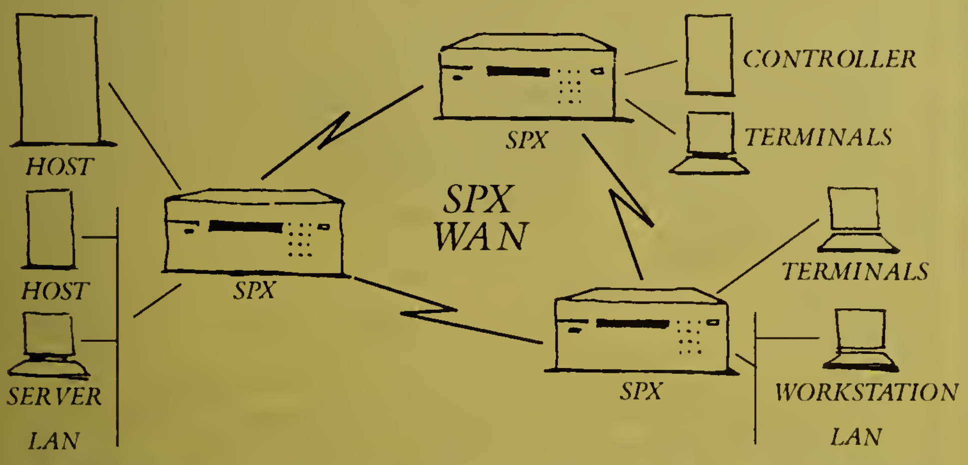
For overnight delivery call:

NETMANAGE™
(408) 973-7171
NetManage, Inc., 20823 Stevens Creek Blvd.
Cupertino, CA 95014 USA
Fax: (408) 257-6405

Circle Reader Service No. **17**

ACCESS MULTIPLEXER

SPX: *Intelligent Wide-Area Networking Multiplexers*



Cost-effective way to build point-to-point, star, and multipoint sub-T1 WANs for terminal-to-host and LAN internetworking.

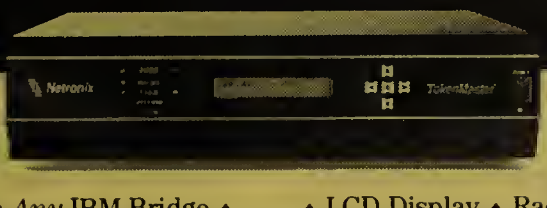
Call 800-388-4NET

NETWORK EQUIPMENT TECHNOLOGIES™

Circle Reader Service No. **18**

BRIDGE CONNECTIVITY

THE ONE BRIDGE IBM WOULD LOVE TO BURN.



NETRONIX 100% IBM Compatible ♦ Higher Performance Than *Any* IBM Bridge ♦ WAN Link Data Compression ♦ IBM LAN Manager and SNMP ♦ Downloadable Software/Flash Memory ♦ LCD Display ♦ Rack Mountable ♦ Less Than 30 Minute Installation ♦ Two Year Warranty

FREE 30 DAY EVALUATION

Local Bridges Start at $4690 ♦ Remote Bridges Start at $5890
To order with confidence or receive more information call:
1-800-282-2535 or 1-707-769-3300

Netronix
Always 100% Compatible.
Never Comparable.

Circle Reader Service No. **19**
A Subsidiary of AMP Incorporated

TOKEN RING CARD

If you're paying more than

$450.00

for your 4/16 Token-Ring MC or ISA Cards

you're paying too much!

GT8311 4/16 Mb ISA	$ 450.00
GT8312 4/16 Mb MC	$ 450.00
GT8313 4/16 Mb EISA	$ 525.00
GT8314 4/16 Mb 8 bit	$ 360.00

Manufactured for General Technology by ***Olicom***

- Certified by Novell® and Microsoft™
- Guaranteed 100% IBM Compatibility and Interoperability
- On-Board Media Filter
- Fastest Through-Put: (Network Computing March 1992) (PC Week November 1990)
- High Performance Drivers for all Major Lan Environments

Additional Discounts if you're not already using the OLICOM manufactured cards

Reseller Inquiries Invited

GTI GENERAL TECHNOLOGY INC.

General Technology, Inc., 415 Pineda Court, Melbourne, FL 32940
407-242-2733 **Sales: 800-274-2733** FAX: 407-254-1407

All trademarks and registered trademarks are the property of their respective companies

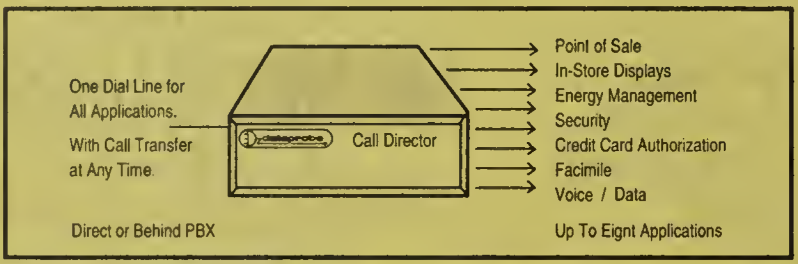
Circle Reader Service No. **20**

CALL DIRECTOR

SLASH Dial Line Costs 87%

The Math is Simple.
Payback = 3 Months

Multiple modems at one location can now share a single telephone line. Dataprobe's Call Director allows calls to be automatically switched to any of eight modems.



dataprobe

170 Coolidge Avenue / Englewood, NJ 07631
Phone: 201-569-6464 Fax: 201-894-0939

Circle Reader Service No. **21**

DATACOM MATRIX SWITCH

DISASTER PROTECTION
DESIGNED INTO THE *MTRX* TANDEM MATRIX SWITCH

THE STANDARD MTRX OFFERS 3-WAY PROTECTION AGAINST LOCALIZED DISASTERS SUCH AS FIRE, WATER, POWER, OR EQUIPMENT FAILURE

1 Separate	MTRX Tandem Matrix Switch Assemblies in different parts of your building
2 Distribute	MTRX Satellites up to 8 miles from each other
3 Connect	MTRX Satellites to the MTRX Tandem Matrix Switch Assemblies over dual, diversely routed Twisted Pair or optical fiber cables

<u>Plus take advantage of these other MTRX BENEFITS</u>

*Largest Non-Blocked Port Capacity...8192 PORTS
*Up To 98% Data Cable Reduction DTE to DCE
*4000 FT DTE to DCE With Twisted Pair Cable
*8 miles DTE to DCE With Optical Fiber Cable
*LAN Based PC Control - Ethernet Or Token-Ring
*Multi-tasking (VM-386) Universal Workstation
*Integral BERG/BERT Test Functions
*Non-Proprietary Database, dBASE III PLUS/dBASE IV
*Supports Data Rates To 2.048MBPS

MTRX-500	512 Ports
MTRX-4000	4096 Ports
MTRX-8000	8192 Ports

Over 50,000 Ports Installed At RBOCs, Government, and Fortune 1000 Companies

Call us Today to Discover the *NEW DIMENSIONS* in Network Management Technology
With the *MTRX* Family of *TANDEM* Electronic Matrix Switches

Datacomm
Management
Sciences Inc.

"The Responsive Ones"

25 Van Zant Street
East Norwalk, CT 06855
TEL: (203) 838-7183

dBASE III PLUS/dBASE IV are trademarks of Ashton-Tate Corporation

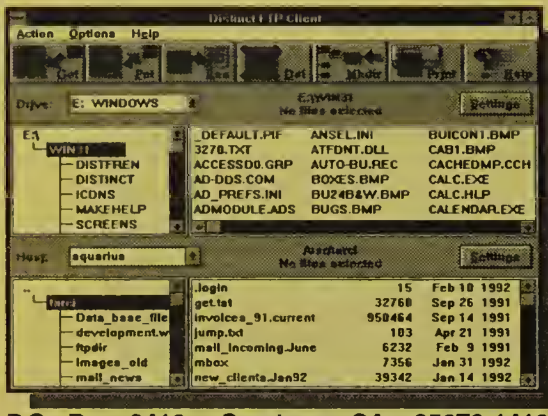
Circle Reader Service No. **24**

CONNECTIVITY SOFTWARE

Distinct® TCP/IP™ for Windows™

INTEGRATED NETWORK SOLUTION FOR MICROSOFT® WINDOWS™

- **Telnet** - multiple and concurrent sessions
- **FTP** - drag and drop - client and server
- **Monitor** - Ping, Statistics, etc
- Menu driven Network Configuration



```
Drive: E: WINDOWS          E:\WIN31
                           No files selected
E:\                 _DEFAULT.PIF    ANSEL.INI      BUICON1.BMP
 WIN31              3270.TXT        ATFDNT.DLL     CAB1.BMP
  DISTFREN          ACCESSD0.GRP    AUTO-BU.REC    CACHEDMP.CCH
  DISTINCT          AD-DDS.COM      BOXES.BMP      CALC.EXE
  ICONS             AD_PREFS.INI    BU24B&W.BMP    CALC.HLP
  MAKEHELP          ADMODULE.ADS    BUGS.BMP       CALENDAR.EXE
  SCREENS
Host: aquarius             No files selected
..                  .login                   15   Feb 10 1992
                    get.tat               32760   Sep 26 1991
  Data_base_file    invoices_91.current  950464   Sep 14 1991
  development.w     jump.txt                103   Apr 21 1991
  ftpdir            mail_incoming.June     6232   Feb  9 1991
  images_old        mbox                   7356   Jan 31 1992
  mail_news         new_clients.Jan92     39342   Jan 14 1992
```

- TCP/IP protocol stack is **100% DLL** (uses only 5K DOS memory)
- Coexists with Novell, Banyan or LAN Manager at **no additional cost**
- Supports NDIS, ODI and Packet drivers
- Optional TCP/IP, RPC/XDR, FTP, Network Windows and Telnet Toolkit

(408) 741 - 0781
Fax: (408) 741 - 0795

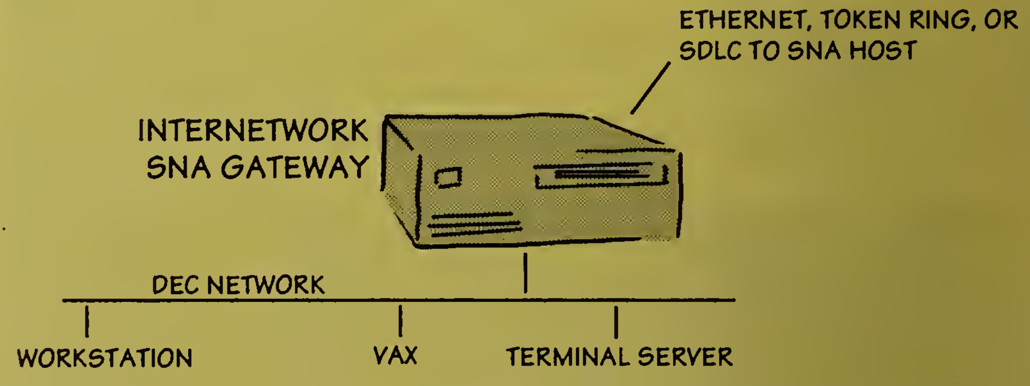
distinct

P.O. Box 3410, Saratoga, CA 95070-1410

Circle Reader Service No. **22**

DEC-TO-IBM

SNA Host Access For LAT-Attached DEC Terminals



With Netlink's Internetwork SNA Gateway™, LAT-attached DEC terminals and printers can access SNA host applications and operate as full-function 3270 devices. Reduces costs while maximizing network flexibility...Eliminates parallel networks...Supports from 16 to 128 SNA sessions...Connects to IBM hosts via SDLC, token ring, or ethernet...Requires no VAX resources!

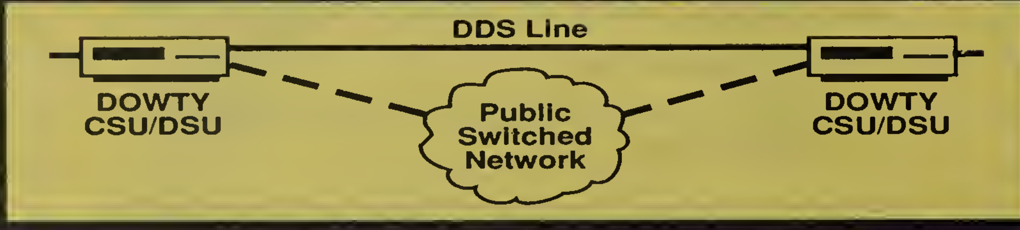
Call 1-800-NETLINK to learn more!

Circle Reader Service No. **25**

NETLINK
INC

CSU/DSU

A CSU/DSU that keeps you up when the DDS line goes down.



The Dowty DCP4856 Multirate CSU/DSU can automatically switch to a dial-up line should the dedicated DDS line fail. Simply choose the integral V.32 modem option when you order. The DCP4856 will sense the failure of the DDS facility, establish the dial-up connection and perform the switchover, downspeeding the data flow as required. There is also a Switched 56 option that lets the DCP4856 dial switched digital services.You won't find a better buy.

For more information on Dowty access devices and on our worldwide support team, call 800-227-3134 or write Dowty Communications, 9020 Junction Drive, Annapolis Junction, Maryland 20701.

- V.35 and RS232 interfaces
- Rate adaption
- Switched 56 access
- Point-to-point and multipoint
- V.54 diagnostics
- Built-in security
- Tabletop and rack mount
- UniMaster network managed

Dowty Communications
Formerly CASE/Datatel

DOWTY

Circle Reader Service No. **23**

DIGITAL LINK SIMULATORS

Programmable Network Link Simulators

Don't Gamble With the Reliability or Performance of Your Network

The Adtech SX/12 and SX/13 Data Channel Simulators let you test your telecommunication equipment's handling of real-world network impairments to ensure system reliability and performance before you bet your business on it. Ideal for testing WANs, bridges, routers, multiplexers, inverse multiplexers, video conferencing equipment, etc. Simulate data links for reliability and performance tests, network equipment evaluations, product development, manufacturing tests, etc. These instantly available links range from RS-232 through T3 and SONET. You can program channel and subchannel delays, Gaussian errors, burst errors, targeted errors and more.

The SX/12 and SX/13 feature:

- ❏ Data rates up to 2.048, 8.448, or 51.84 Mbps
- ❏ Delays up to 10 seconds in 1 ms, 1us, or 8bit steps depending on model and data rate
- ❏ Gaussian and burst error generation with rates from 9.9×10^{-1} to 1.0×10^{-12}
- ❏ Program complex sequences of link events
- ❏ Options permit targeting errors and delays at specific bits and subchannels of links
- ❏ Over 10 plug-in link interfaces available from RS-232 to DS-3(T3) and SONET STS-1
- ❏ IEEE-488 or RS-232-C remote control ports

ADTECH
INC

1814 Algaroba Street
Honolulu, HI 96826

Circle Reader Service No. **26**

Call or fax for more information or a demonstration: 808-941-0708 or Fax 808-946-1300

DSU

THE DIGITAL NETWORKING LEADER

THE OFFICE-READY, INTELLIGENT DSU.

Our new DeskTop 500A Data Service Unit offers easy installation and diagnostic testing by nontechnical personnel at remote sites. Its compact, attractive design is just right for the office. A front-panel electronic display provides line speed, alarms, and test data at a glance.

No adapter cables needed; the DeskTop 500A automatically selects CCITT V.35 or EIA 232-D interface and all DDS data rates. For easy order information, call the leader in digital networking at 1-203-792-0542, or toll-free at **1-800-777-4005.**

General DataComm

WORLD CLASS NETWORKING

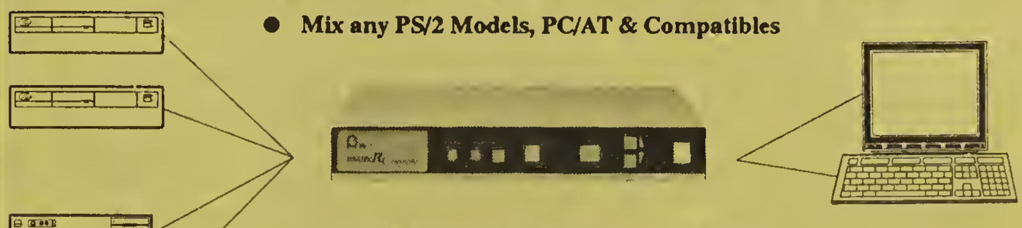
Circle Reader Service No. **27**

KEY BOARD/MONITOR SWITCHING

masteRConsole™

Control 2 To 64 PCs with One Keyboard and Monitor

Eliminate Keyboard/Monitor Clutter



- **Automatically Boots each PC at Power-up for Unattended Operation**
- **Mix any PS/2 Models, PC/AT & Compatibles**
- **100% Electronic Switch for Reliability**
- **Select or Automatically Scan each PC**
- **4, 8 and 16 PC Capacity, Expand to 64**
- **Desktop or Rackmount**

Save $ **Save Space** **Save Time**

The masteRConsole eliminates the clutter and cost of excess keyboards/monitors, reclaims valuable space, simplifies operations and centralizes control for environments with multiple PCs:

- **File Servers**
- **Communication Servers**
- **LAN/WAN Bridges and Gateways**
- **Dial-in Access Applications**
- **Hardware/Software Testing**

RCI
10-1 Ilene Court, Belle Mead, NJ 08502
Tel: 908-874-4072 Fax: 908-874-5274

Circle Reader Service No. **30**

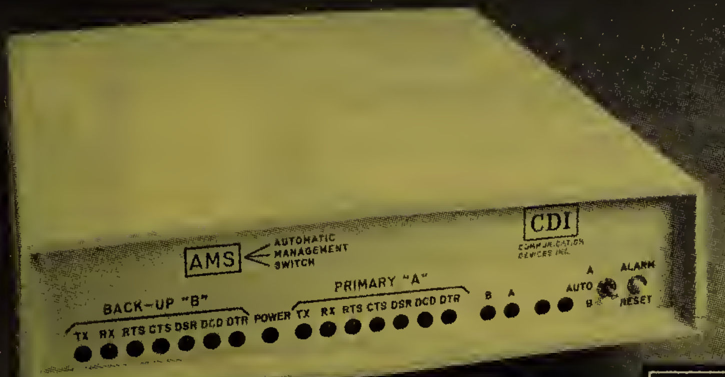
FALL BACK SWITCH

Network Management Fallback Switch

The CDI AMS reduces your back up line costs

CDI's AMS is day and time programmable—it backs up the circuit only when required. Not only that, it's microprocessor based, so it can store multiple backup numbers. The backup is backed up. Real time reporting and the power of a microprocessor included.

CDI automatic switch - it's like having a technician on site.


AMS
AUTOMATIC MANAGEMENT SWITCH
CDI
BACK-UP "B"
TX RX RTS CTS DSR DCD DTR
POWER
PRIMARY "A"
TX RX RTS CTS DSR DCD DTR
B A
AUTO
ALARM
RESET

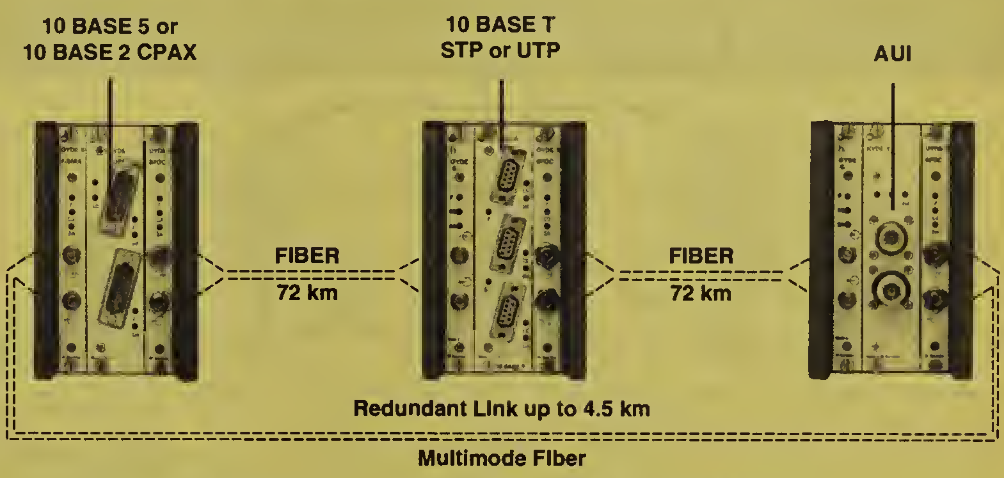
Communica [illegible] 01
Phone 20 [illegible] • 800/359-8561

[illegible] eader Service No. **28**

CDI

LAN CONNECTIVITY GEAR

MULTIMEDIA ETHERNET CONNECTIVITY SOLUTION



- **RUGGEDLY DESIGNED FOR RELIABLE PERFORMANCE**
- **UNIQUE REDUNDANCY CONCEPT**
- **SUPPORTS UP TO 7 DIFFERENT TRANSMISSION MEDIAS**
- **FULL DESIGN AND INSTALLATION SUPPORT**

Hirschmann

RICHARD HIRSCHMANN OF AMERICA, INC.
INDUSTRIAL ROW • P.O. BOX 229
RIVERDALE, NEW JERSEY 07457
Tel: (201) 835-5002 FAX: (201) 835-8354

Circle Reader Service No. **31**

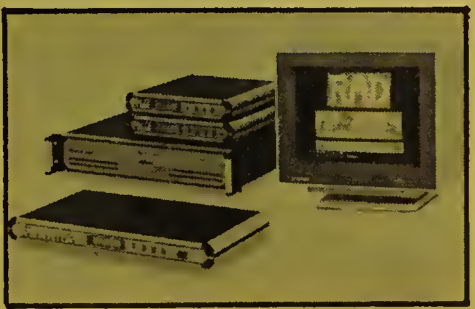
FRACTIONAL T-1

FRACTIONAL T1 ACCESS UNITS

DROP & INSERT

COMPLETE PRODUCT LINE TO SUIT ALL YOUR FT1 NEEDS

RAD's full line of Fractional T1 access products provide solutions to your FT1 data and voice applications. The line includes a family of CSU/DSUs and high-speed multiplexers.



RAD
From the growing Rad family.
data communications inc

TELEPHONE
(201)529-1100
FAX:
(201)529-5777

Circle Reader Service No. **29**

LAN HARDWARE

LAN HARDWARE REPAIRS

Component (chip) level repair of LAN Hardware

Full 1 Year Warranty on all boards repaired! Standard • (4-7) day turnaround optional – overnight service

Hardware Specialties:

3 Com • Corvus • IBM • Interlan • Novell • Proteon • Standard Micro Systems (SMC) • Western Digital • Pure Data • Gateway • Thomas Conrad • Intel • Madge • Tiara • Exos • Aquila & Others

Call For Free Information Packet

LANFIX Inc.
DBA LAN RECYCLERS

We also Buy & Sell New & Used LAN Hardware

1-800-448-7420

FAX: 1-800-752-6958
PHONE: 1-801-226-1832

1378 West Center St. • Orem, Utah 84057

Circle Reader Service No. **32**

LAN INTERNETWORKING

FREE MANAGEMENT BRIEFING ON LAN INTERNETWORKING.

Interested in a new approach to LAN internetworking? Get this special General DataComm report on LAN Transport Management.™ This paper describes the advantages and disadvantages of traditional bridges and routers, and introduces a unique new approach from GDC.

LAN Transport Management offers traditional routing where required, bridging where desirable - and a new capability that provides routing, independent of all protocols, plus completely open network management. For your free copy, call 1-800-777-4005.

General DataComm

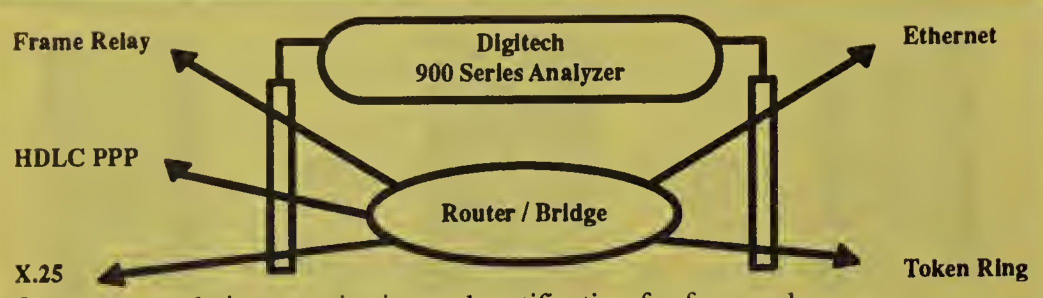
WORLD CLASS NETWORKING

WORLD HEADQUARTERS 1-203-574-1118 HONG KONG 852-526-5511 CANADA 1-416-498-5100 AUSTRALIA 61-2-956-5099
UNITED KINGDOM 44-734-774868 EUROPE, AFRICA, MIDDLE EAST HEADQUARTERS 33-1-30570200 JAPAN 81-33-862-1730

Circle Reader Service No. **33**

LAN/WAN INTERCONNECT TESTING

WAN/Frame Relay Testing to 2MB LAN Interconnect Testing



- Complete emulation, monitoring and certification for frame relay
- High performance - test 100% utilized circuits to 2MB
- 386 PC based - simultaneously test LAN's & high speed WAN's under windows
- Independently layered decodes include frame relay, HDLC PPP, HDLC/X.25, SDLC/SNA, Q.931, RFC-1294 encapsulation,IP, IPX, TCP, on WAN networks
- Unique two port switch / network emulation
- LAN annalysis for Ethernet and 4/16MB Token Ring networks
- 7 Layer decodes include TCP/IP, Novell, **Apple Talk**, DECNet on LAN networks

Digitech Industries Inc
66 Grove Street Ridgefield • CT 06877 USA

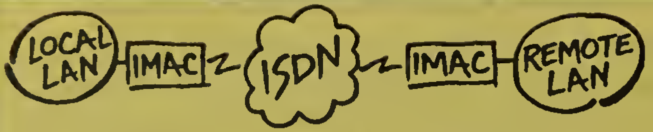
CALL 1-203-438-3731

Circle Reader Service No. **34**

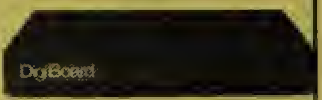
LAN/WAN INTERNETWORKING

ISDN Connectivity

Now for just $2,195, your Ethernet LAN can go anywhere ISDN goes. With "local" performance for every user.



Introducing DigiBoard IMAC, a far-reaching cost/performance break-through in LAN bridge technology. DigiBoard IMAC provides the industry's first direct, completely transparent connection between Ethernet and ISDN. It works with any network OS. Any host, platform or bus. Any ISDN CCITT switch, including AT&T and Northern Telecom. And it gives remote LAN users the "local" performance they've been asking for. All for just $2,195, plus an affordable ISDN line cost of $40 to $60 per month. Call for the whole story, then let us arrange an on-site NO-RISK TRIAL. See why DigiBoard IMAC is the smartest LAN bridge connection you can make.



Circle Reader Service No. **35**

DigiBoard
Connectivity Solutions from Digi International

© 1992, Digi International Inc. (800) 344-4273 · (612) 943-9020 · FAX (612) 943-5398

MAC/DOS/WINDOWS/CLIP-ART

An Introductory Offer From NETWORK WORLD

NetDraw

Clip Art for Building Networks ™

Because In Your Job, A Picture Is Worth Much More Than 1,000 Words.

- The first clip art library created exclusively for networking professionals
- Over 170 professionally drawn symbols for Computing, WANs, LANs, Telephony Personal Computing, Patching and Cabling
- Available for DOS, Windows and Macintosh applications
- Symbols can be pasted into a variety of graphics, word processing, page layout and presentation documents
- Available at a low introductory price of $99.95

Price/availability subject to change. 30-day guarantee conditions: shipping/handling not refundable, product must be in original condition. Seal must not be opened on software. All trademarks and tradenames are properties of their respective owners. Allow 4-6 weeks for delivery.

Circle Reader Service No. **36**

Call 1·800·643·4668 to order your copy today!

MULTI LINE CSU/DSU

WHEN SELECTING T1 DSU/CSUs, PUT YOURSELF IN THE PLUS COLUMN

- Access to T1, fractional T1 and virtual private networks
- Drop and Insert
- 2 ports, expandable to 6
- Support of 1 or 2 T1 lines
- T1 performance monitoring
- Verinet 2 integrated remote management for ConnecT1 Plus and all Verilink ESF CSUs
- Verilink Value

SO GET INTO.....THE PLUS COLUMN

FOR YOUR FREE VERILINK PLANNING KIT

CALL TODAY

1-800-669-4278

THE HELFRICH COMPANY

Circle Reader Service No. **37**

ConnecT1

PLUS

NETWORK BASED CALENDAR

MEETING TODAY!

WHAT IF YOU HELD A MEETING ...

AND NO ONE CAME?

MON.
TUES.
WED.
THURS.
FRI.
SAT.
SUN.

CalScan Network Based Scheduling Calendar
For Macintosh and IBM compatible computers.

- MAC/DOS software for calendar scheduling
- Networked meeting management in mixed MAC/DOS environments
- Group and individual scheduling

To order or to receive a free demo disk call **(703) 243-9550**

See us at MACWORLD/Boston Booth #1944
RBC, Inc. 2101 Wilson Blvd., Suite 801 Arlington, VA 22201

Circle Reader Service No. **38**

Send for free information

For more information on any of the products and services advertised in *Network World's* Action Center, circle the Reader Service Numbers on this card which correspond to the advertisements of interest to you.

Complete the coupon information and
mail to: **NETWORK WORLD**
The Newsweekly of Enterprise Networking Strategies

Name
Title
Company
Street
City
State Zip
Phone

(July Expires Oct. 31, 1992)

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	
18	19	20	21	22	23	24	25	
26	27	28	29	30	31	32	33	
34	35	36	37	38	39	40	41	
42	43	44	45	46	47	48	49	
50	51	52	53	54	55	56	57	

Send for free information

For more information on any of the products and services advertised in *Network World's* Action Center, circle the Reader Service Numbers on this card which correspond to the advertisements of interest to you.

Complete the coupon information and
mail to: **NETWORK WORLD**
The Newsweekly of Enterprise Networking Strategies

Name
Title
Company
Street
City
State Zip
Phone

(July Expires Oct. 31, 1992)

1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33
34 35 36 37 38 39 40 41
42 43 44 45 46 47 48 49
50 51 52 53 54 55 56 57

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 716 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

NETWORK WORLD
The Newsweekly of Enterprise Networking Strategies

P.O. Box 5090
Pittsfield, MA 01203-9828

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 716 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

NETWORK WORLD
The Newsweekly of Enterprise Networking Strategies

P.O. Box 5090
Pittsfield, MA 01203-9828

NETWORK SERVICES

AP SATNET

A Wholly Owned Subsidiary of The Associated Press

DOMESTIC & INTERNATIONAL

Satellite Data Broadcast
(U.S. - South America - Europe)

X.25 Packet Switching

Terrestrial Services

3rd Party Installation & Maintenance

AP SATNET
50 Rockefeller Plaza
New York, NY 10020
Tel. # (212) 621-7800
Fax # (212) 621-1512

Call us for a FREE consultation TODAY!

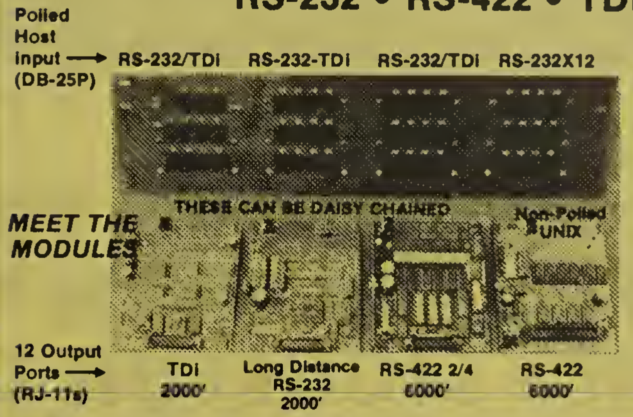
Circle Reader Service No. **39**

TERMINAL CONNECTIVITY

CPS P-CON 48 PATCH PANEL CONVERTER

THE FLEXIBLE TWISTED PAIR CABLING SYSTEM FOR POLLED AND NON-POLLED TERMINAL NETWORKS

RS-232 • RS-422 • TDI (Unisys)



- Use Same Topo for Future LANs
- Modular 12-48 Ports per Panel
- Add 12 Port Modules as Needed
- Each Port is Separately Regenerated
- Transparent to Data Rates to 115 KB
- LEDs and Audible Streaming Alert
- Mix and Match Modules on the Same Panel
- Fits Standard 19" Rack
- Stand Alone 12 Port Version Also Available
- Terminal End Converters and Boosters for Extra Long Cable Runs Are Available

Average $50 Per Port

Beats the SR Modem Approach

The Snap On MODULES Provide the Signal Disciplines that You Need to Turn Your Passive Cabling System into an Active Long Distance Twisted Pair System.

Circle Reader Service No. **42**

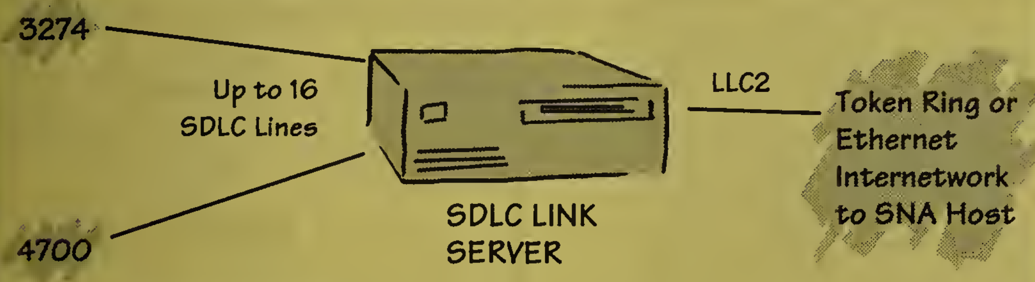
ALSO
- Modem Sharing
- Fiber Optic Conv
- Port Sharing
- Dialer Products

Computer Peripheral Systems
P.O. Box 98282
Atlanta, Georgia 30359

Phone: 1-800-888-0051
(404) 908-1107
Fax: (404) 908-1208

SNA INTERNETWORKING

Netlink's SDLC Link Server.™ Now, An Even Better Way For SNA.



- Connect SDLC devices to token ring or ethernet LANs.
- Convert SDLC data to LLC2.
- Transport SNA across your internetwork.
- Merge parallel networks; reduce costs.
- Improve network performance.
- Manage via IBM's NetView® or our new In/View™ program.

Call 1-800-NETLINK!

NETLINK INC

Circle Reader Service No. **40**

TOKEN RING ADAPTORS

3274 + RA1200 = 3174

- Dedicated hardware that uses the IBM Token Ring chipset.
- Remote configuration with *standard* Telnet and TCP/IP.
- Network Management — supports both Netview and SNMP.
- Reliable — eliminates single points of network failure.
- Two ports — supports up to ten 3274s in multi-drop mode.
- Multiple unit pricing as low as $1,800 per unit.

RING ACCESS

957-R INDUSTRIAL ROAD, SAN CARLOS, CA 94070 • TEL (415) 592-5853 • FAX (415) 592-5841

Circle Reader Service No. **43**

QUICK SCANNER

THE EASIEST POSSIBLE WAY TO TROUBLESHOOT YOUR LAN.

QUICK SCANNER™ makes network troubleshooting a breeze. It's the first Scanner that's completely menu driven. All you need to do is turn it on, attach the cable to it and push a single button. In seconds it tells you where and what the problem is.

QUICK SCANNER

- Easy to use menu-driven format
- Pinpoints faults in LAN cabling using TDR cable radar
- No technical jargon or complicated instructions
- Displays results in plain English (i.e. "Short at 78 ft.")
- Tests all twisted-pair and coax cables
- Monitors Ethernet network activity
- Performs standard tests with no user input

For more information about QUICK SCANNER and your free LAN Troubleshooting Guide, contact Microtest at 800-526-9675

©1992 Microtest Inc., 3519 E. Shea Blvd., Phoenix, AZ 85028, 602-971-6464 Fax: 602-971-6963

Circle Reader Service No. **41**

MICROTEST®

VOICE/DATA/FAX MULTIPLEXER

DATA RACE Announces Multiplexer Breakthrough

NEW Voice/Fax/Data Multiplexer saves end-users tens of thousands of dollars

By Paul Longoria

SAN ANTONIO, Texas — If you can say yes to the next two questions then you may be in for a pleasant surprise!

1. Do you have remote computer users that need access to your LAN, mini, or mainframe?
2. Would you be interested in eliminating a substantial portion of your expensive long-distance telephone charges?

Powerful, New Technology

Now, thanks to the emergence of a powerful new class of multiplexers, you can save up to $6,000 per user per year in operating and line costs AND save up to an additional $23,712 per year in long-distance charges for each phone line you replace!

> **"Our company was wasting $83,712 a year without DATA RACE's MACH DS Mux"**
> **— MIS Manager**

Be A Budget Hero!

With today's economic climate, corporate management will be pleased with Data Communication Managers that use this affordable, new technology as an easy, fast way to save on tight budgets.

New Industry Leader

DATA RACE, a long-time price/performance leader in the statistical multiplexer field, is introducing the industry's most cost-effective, high performance Voice/Fax/Data Multiplexer series. From 8 to 64 ports, the new MACH DS multiplexers include these 5 important features:

1. Toll-Free Voice and Fax
2. Up to 3 Voice channels per link
3. Multiple Digital or Analog links
4. Connects to existing facilities
5. Pays for itself in months not years!

Free, No Risk, 30-Day Trial

For a limited time, DATA RACE is offering a FREE savings evaluation survey and a FREE 30 day no-risk trial to qualified users. For details call 1-800 999-7223.

DATA RACE, 11550 IH 10 West, San Antonio, Texas 78230

Circle Reader Service No. **44**

NETWORKING MARKETPLACE

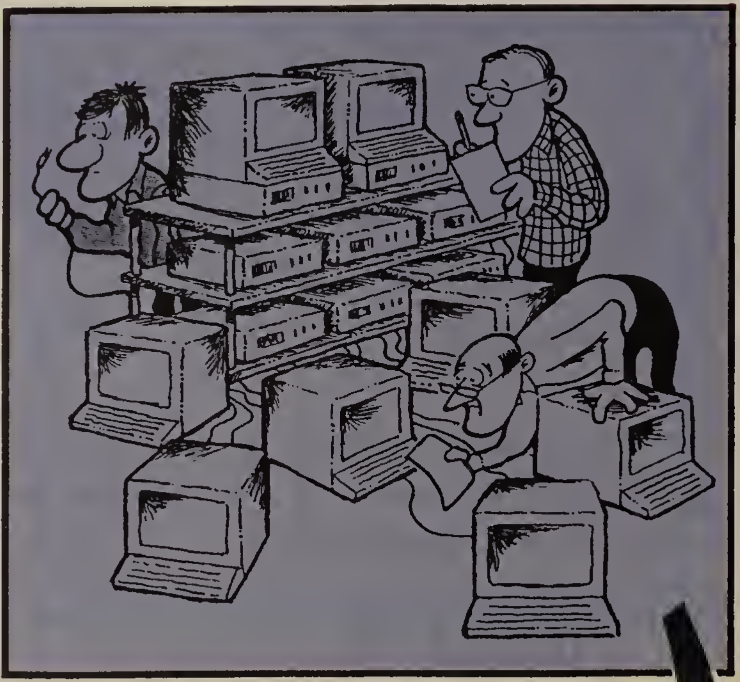
LANS

CONTROL UP TO 96 PC FILE SERVERS WITH 1 KEYBOARD AND MONITOR USING...

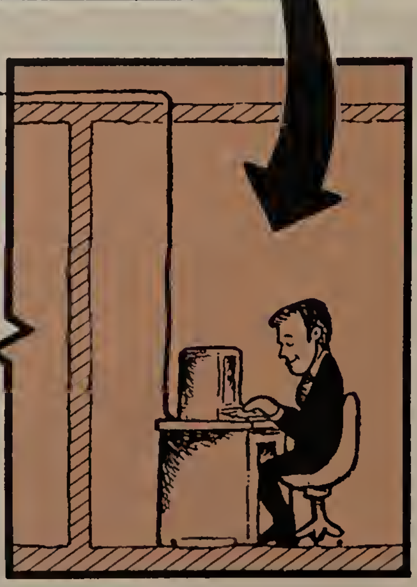
COMMANDER

by cybex

- Select via Keyboard
- Dual access up to 250 feet away (optional)
- No external power
- Mix PC, PC/XT, PC/AT and PS/2
- "AutoBoot™" Feature boots attached computers without operator intervention
- Shows PC power status



- PS/2 Mouse support available
- Each unit accommodates from 2 to 8 PCs
- Up to 12 units can be cascaded
- Mounting kit available for 19" and 24" rack installation



Dealer Program Available

Cybex Corporation
2800-H Bob Wallace Ave.
Huntsville, Alabama 35805
(205) 534-0011
Fax (205) 534-0010

PC, PC/XT, PC/AT and PS/2 are trademarks of International Business Machines Corp.

DATA COMM

SAVE 50% & MORE
ON MOST PRODUCTS
BUY/SELL/NEW/USED
Reconditioned With Warranty

Modems • Multiplexers • T-1 • CSU/DSU's • Channel Banks •

AT&T CSU/DSU NEW!	$275
T-1 CSU's	$499
T.P. 557 CSU/DSU 56Kbps	$195
Infotron T-1 Equipment	60% Off
Datatel 9100	CALL
Tellabs 440 and 445	50% off
Newbridge Channel Banks	$3995
Omnimux 82 muxes-8 port	$695
Stat Muxes 4,8,16,32, port	LOW
Ethernet Bridges NEW!	$1695

METROCOM
(800) 364-8838
or (713) 783-8838
FAX (713) 783-8832 24 HRS

"LOWER YOUR EXPENSES, ...NOT YOUR EXPECTATIONS"

FOR THE LARGEST
INVENTORY OF
SECONDARY

N.E.T.
&
TIMEPLEX

T-1 NETWORKING EQUIPMENT

PLEASE CALL ANDREW PEROS
609-661-0040

Frame Relay Concentrator

- Input 120 frame relay streams on 5 T-1s, CSU or DSX-1.
- Take out V.35 (to 2 M/s) or FT-1 frame stream.
- Transports X.25 or any HDLC protocol as frames.
- Only 5 rack units (5.25 in.) high, 12 in. deep.
- AC or -48 V dc power.

800-521-2496
FastComm
Communications Corp.
Sterling, VA 22170

Call
today
for more
information!

The Networking
Marketplace
Shannon Summers
800-622-1108 x. 596
or 508-875-6400

INSTALLATION SERVICES

Call for Cable

Save on custom assemblies or bulk cable & accessories
- Immediate Delivery
- Guaranteed Quality

ELEKTRO ASSEMBLIES INC.
522 - 6th Ave. NW, Rochester, MN 55901
(800) 533-1558
FAX (507) 288-9655

NATIONWIDE COMPUTER CABLING SERVICES

Exclusive Support For The OEM, VAR, System Integrator and Multiple Site End User Markets

- Fiber Optics, UTP, STP, Coax
- Over 130 service locations nationwide
- Multiple cable medium integration specialists
- Local installation support with nationwide coverage
- Non-competitive/complementary service to OEMs/VARs/SIs

Call 1-800-LAN-SERV For More Details

PREMISES
ONE°LAN SERV

• FDDI • Ethernet • Token Ring • ARCNet •

Exclusive Lifetime Warranty

COMPUTER CABLING DESIGN AND INSTALLATION

WE SPECIALIZE IN:
- Local area Network Wiring Topologies.
- Multiple site installations through our unique National Affiliate Network (NAN) program.

COST EFFECTIVE NETWORKS

• *Fiber Optics* • Token Ring • Ethernet • UTP

CERTIFIED INSTALLERS FOR:

• IBM's COS • DEC • MOD-TAP • STAR-TEK

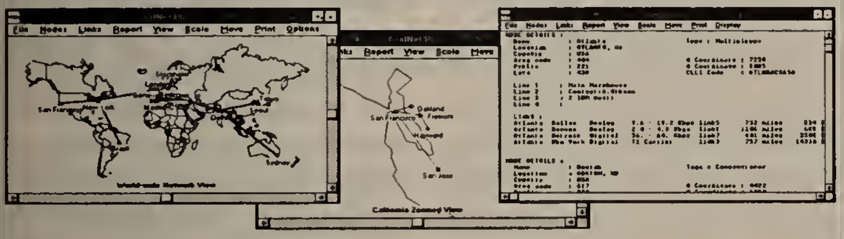
OVER 500 INSTALLATIONS IN OVER 40 STATES!

Call For Our Nationwide Services
800-283-2821

BICSI
DATA CONNECTION
Progressive Communication Inc

SOFTWARE

GrafNet Plus will display and document your network from Atlanta to Zurich...and more



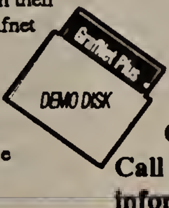
Powerful graphics and extensive reports

Grafnet Plus is a powerful presentation system for displaying networks spanning the world. The software runs under MS Windows' user friendly, menu driven interface.

You may define network nodes by entering a phone number or through their Latitude and Longitude value. Grafnet Plus will automatically plot these on geographical maps of the world and its countries. It can read and update a screen display from changes made to a text file.

Grafnet Plus also maintains comprehensive data storage capability of network parameters presented as formatted reports. The network graphs and reports may be displayed on the screen or sent to a printer.

Extensive options exist for customizing the displays and print-outs. You can select screen colors, node symbols and colors, line styles and colors. You can specify the complete page and layout format for printing the displays.



GrafNet: $450
GrafNet Plus: $750 to $1000
Call (408) 446-9598 today for information and a free demo disk.

Network Dimensions, Inc.
5339 Prospect Rd., #122, San Jose, CA 95129

TELECOMMUNICATIONS

PUBLIC NOTICE
TO
ALL AT&T PRIVATE LINE CUSTOMERS
(ACCUNET T1.5, T-45, ASDS, DDS)

Discounts up to
57%
on Monthly Line Charges

Huge Savings Available With This New Aggregated Program.

CALL FOR INFO
1-800-722-2668

GLOBAL LONG DISTANCE MKTG.
7051 W. Commercial Blvd
Tamarac, FL., 33319

Need Internet Access at Affordable Rates?

JvNCnet introduces low cost, easy to use Internet dial-up service

Open your desktop to 4 million people throughout the world. Whether you need interactive capabilities, electronic mail, or access when you travel, JvNCnet has a dial-up service that meet your needs. Service includes an easy-to-use software interface. We also provide Internet access via dedicated lines and turn key service 24 hours a day, 7 days a week.

B6 von Neumann Hall, Princeton, NJ 08544 1-800-35-TIGER

COMPUTERS

HIGH VOLUME AT&T COMPUTER PERIPHERAL SALES & PURCHASES

- Modems
- Color Terminals
- Data Sets
- Controllers
- Keyboards

C T D I
Communications Test Design, Inc.

800-458-0398
215-431-5941

TRAINING

LAN
X25 • T1
Available Soon
FRAME RELAY

TELETUTOR®

FREE DEMO
1-800-542-2242
FAX (603) 433-2260
CALL FOR CATALOG OF ALL OUR COURSES

NETWORK TRAINING!

LAN BASICS
SNMP
TCP/IP

$39.95

Call for a free catalog of all our money-saving courses
1-800-967-9391
Tech-Ease Corporation, Mt. View, CA

AUCTIONS

PUBLIC AUCTION

World Class Two-Day Public Auction 400,000 Sq. Ft. Electronic Manufacturing, Engineering and Office Facility
Plant Closed - Surplus To The Needs Of

NCR CORPORATION Cochran Street
Cambridge, Ohio

TUE. & WED., JULY 28TH & 29TH - Starting: 10:00 AM Each Day

Inspect: Fri., July 24th & Mon., July 27th - 9 AM to 4:00 PM Each Day

FEATURING: Electronic Test & Assembly Equip., 9,000 Sq Ft Clean Room, Warehouse, Shop & Office Equip.
SPECIAL FEATURE: 1.5 Million Cost Hermann-Miller Modular Office Furniture, All Purchased New 1980's.

Call or Write For Illustrated Brochure ***Cincinnati Industrial Auctioneers, Inc.***
P.O. Box 23056
Ph. (513) 241-9701
Cincinnati, Ohio 45223
Fax (513) 241-6760

New software targets mgmt.

continued from page 1

ver computing."

Fung, who founded EcoSystems last year, previously developed the first mini-Cray supercomputer, called the Supertek S-1, which is now sold by Cray Research, Inc.

EcoSystems demonstrated EcoSphere in a private suite during Database World Exposition held here last week. The software, which is currently in beta test at five companies, will be announced in August and begin shipping in September, company officials said.

The initial release of EcoSphere will manage terminals, personal computers and Unix workstations linked to Unix servers running Oracle Corp.'s Oracle Server relational database management system. Future releases will be able to manage OS/2- and Novell, Inc. NetWare-based client/server environments.

EcoSphere will come bundled with applications that enable users to manage Oracle databases. It will also come with a tool kit for developing custom management applications for other hardware and software platforms.

Future releases will be able to manage OS/2- and NetWare-based client/server environments.

▲▲▲

Fung said EcoSphere provides a more comprehensive approach to managing client/server environments than integrated management systems, such as Sun's SunNet Manager or IBM's NetView. He said EcoSphere will enable users to manage both hardware and software, whereas the integrated management systems typically only manage hardware.

EcoSphere provides configuration, fault and performance management information for client/server computing platforms. For example, it can display information on the applications and databases that reside on each client and server, and detail which clients are working with which servers. It can also chart utilization of databases and computers to determine whether network devices are overloaded or creating errors, or whether attached printers are down.

The software can help administrators pinpoint the source of problems that are difficult to detect because of the complexity of the client/server environment. For example, administrators can correlate performance, fault and configuration data to determine whether a system slowdown is caused by a network bottleneck, an application hogging resources or a database overloaded by data requests.

Company officials said users with large client/server networks or multiple subnetworks will probably need to install multiple EcoSphere management stations.

Administrators can configure EcoSphere both to receive alarms from agents on remote devices across a network and to log data on system activity into a central repository for later analysis.

When EcoSphere receives an alarm from an agent, it executes an action to resolve the problem, such as sending an electronic mail message to a technician, running a program that handles the problem or sounding an alarm.

EcoSphere contains a utility called the Grapher, which lets users draw charts and graphs based on status information collected in the EcoSphere repository. It also has a feature called EcoMeters, which displays status information about as many as eight system elements in real time on the management console screen.

EcoSphere is based on an object-oriented model, which means that each agent, alarm and action is a discrete object with a unique identifier. EcoSphere communicates with agents or objects using standard remote procedure calls across Transmission Control Protocol/Internet Protocol nets.

Object orientation provides several benefits. It allows systems developers to reuse EcoSphere objects to manage new parts of the client/server system. It also allows customers to integrate into EcoSphere software tools developed in-house or by other vendors for use as agents, events or actions.

EcoSystems has developed a set of agent and action objects, called EcoTools, that it will also make available in September. Initial EcoTool releases are designed to monitor Oracle Server systems, including such things as transactions per second, percentage of network errors, percentage of CPU utilization and latch contention rates. The company plans to eventually introduce EcoTools for other database platforms, including Microsoft Corp.'s SQL Server.

EcoSystems will also introduce in September a set of tools and procedures called EcoWorks that lets third-party developers and systems integrators customize EcoSphere to client installations.

EcoSphere currently uses Sun's OpenWindows graphical user interface but, in future releases, will support Open Software Foundation, Inc.'s Motif. The company also plans to support EcoSphere on Unix machines from vendors other than Sun.

Pricing for EcoSphere will depend on client/server configuration. ◪

AT&T gives SDN routing

continued from page 10

not yet calculated how much money the company will save by replacing the T-1s with SDN links.

"If SDN is as efficient as private lines [between call centers] and costs less, we'd definitely use it," said Bob McGrail, executive vice-president with Hospitality Franchise Systems. "And if it didn't cost less, we'd still try to make a business case for using it."

Hospitality Franchise Systems is the parent company of Days Inns of America, Inc., which began using Look Ahead Interflow in 1989. Hospitality Franchise Systems operates call centers in Knoxville, Tenn., Phoenix, and Oklahoma City. McGrail said the company plans to open a new center in Parsippany, N.J., soon.

According to Pierce, the SDN version of Look Ahead Interflow will be most popular with midsize and small call centers. She said most call centers have fewer than 50 agents.

Analysts that specialize in call center design point out that enabling users to pool agents without bringing them to one location will be a key selling point for AT&T.

"Any company that can bring all its agents under one roof or use something like Look Ahead Interflow to pool them will see great efficiencies of operation," said Brad Cleveland, a consultant with Incoming Calls Management Institute, an Annapolis, Md., call center education and design firm.

The public network version of Look Ahead Interflow is available now. ◪

NIST encryption standard to bow

continued from page 2

identity and verify the originality of the contents.

The DSS proposed by NIST last year contains a 512-bit key, which several organizations, including Bell Communications Research, Digital Equipment Corp. and RSA Data Security, Inc., criticized as being weak. It was suggested that the 512-bit scheme might be secure in the short run, but growing computational power would render DSS vulnerable in the near future.

"Security depends on the length of this modulus, and while this length seems adequately secure for now, as processors get faster and cryptanalytic techniques mature, it is likely that this length will be insufficient just a few years from now," said Morris Gasser, technical director of DEC's secure systems group, in public comments filed with NIST.

"We plan on modifying the standard in response to the criticism," said Lynn McNulty, associate director for computing at NIST. "The next key size will be increased from 512 to 1,024 [bits]. We're giving users the authority to pick sizes in 64-bit increments between 512 and 1,024 [bits]."

Controversy has swirled around DSS. Most industry participants had hoped NIST would sanction use of available digital signature technology from RSA instead of crafting a new standard. Some suggested the reason NIST had ignored the RSA algorithm is because of pressure from U.S. intelligence agencies, which were afraid that the high integrity of the RSA technology would cripple surveillance efforts.

Bellcore even suggested that DSS contains a "trapdoor" to facilitate government surveillance, a charge McNulty denied. "We think we've resolved the allegation about it being weak and having a trapdoor," she said.

McNulty said NIST has just been told by the U.S. Patent Office that it has been granted a patent for DSS. NIST had applied for a patent so the government could make the specification available to vendors royalty-free in the U.S.

"This removes the clouds over DSS by others who alleged infringement," McNulty said. "The U.S. Patent Office has concluded our claims are valid."

However, noting that opponents can still sue in court, she said, "This could have a chilling effect" on vendor interest in producing DSS-compliant products.

Dennis Branstad, chief scientist in NIST's computer systems division, said NIST plans to hold a workshop for vendors this fall in an attempt to build interest in developing products conforming to DSS, which he said would certainly be issued as a Federal Information Processing Standard. He noted that Information Security Corp. in Deerfield, Ill., has already created a commercial implementation of DSS. ◪

Letters

continued from page 35

missed the mark on companies' increasing desire to establish overseas hubs. While the writer correctly points out that foreign post, telegraph and telephone administrations are lowering their international private-line rates, this is true mainly for circuits from their countries to the U.S. It is not typically the same scenario for circuits between countries within their respective regions.

Hong Kong, for instance, charges almost the same for circuits to Japan or Singapore as to the U.S. In this case, there's obviously little economic incentive for a U.S. multinational firm to establish a hub there.

I find that the declining costs for point-to-point circuits directly in and out of the U.S. and the fact that U.S.-based telecommunications managers have increased operational control of their nets are just two good reasons why users are foregoing the establishment of overseas hubs.

Randy Sherman
Manager of international services
Sprint International
Reston, Va.

Editor's response: The process of buying an international private line is no doubt more complex than buying a domestic service. But the concerns users face are indeed quite similar.

Clearly, circuit redundancy is a major issue. While the article advises users to obtain redundancy in foreign countries, Mr. Sherman correctly points out there is also the need for redundancy at the cable head in the U.S.

However, the concern about obtaining international redundancy is really no different than that of obtaining redundancy in domestic services.

On the issue of international hubs, the article does not imply that users have an increasing desire to establish hubs overseas.

Rather, it points out that foreign carriers have been using pricing to try and entice users to establish hubs in their countries. It also states, as does Mr. Sherman, that establishing a hub in the U.S. is a viable alternative for some users. ◪

Option readied for NetWare 4.0

continued from page 1

SFT I and II, which come free with existing versions of NetWare, mirror only disks and their controller boards. So they protect data from loss should a server or disk crash but do not prevent network downtime.

Novell expects to pepper up to 500 sites with beta software that works with NetWare 3.11, but the product it plans to ship next year will require what will undoubtedly be a more expensive NetWare 4.0.

Young said the beta version of SFT III, which is only about 70% complete, could be fitted to work with either or both 3.11 or 4.0, but Novell chose 4.0 because it has supplanted NetWare 3.X as Novell's enterprise network solution. "We came to the conclusion that, because 4.0 is the next generation, we'd do the extensive amount of finishing work that SFT III requires on 4.0 instead of 3.11," Young said. Just as it had for its X.500-based distributed directory services, Novell decided to develop SFT III on NetWare 4.0

Young sidestepped the issue of disgruntled 3.11 users who thought they would be able to buy SFT III to work with their existing nets. "We didn't promise that SFT III would run on 3.11," he said. "We might have implied that."

Novell will reach some of its new SFT III beta sites through companies that are designing hardware to work with the software. Compaq Computer Corp. and Everex Systems, Inc. are the only two companies that have announced hardware designed to take advantage of SFT III. But the companies are already feuding over how to use the software.

Compaq is offering a 100M bit/sec fiber-optic link that transforms any two servers into mirrored servers under SFT III. Everex, on the other hand, is building dual servers connected by an Extended Industry Standard Architecture bus.

According to Everex officials, a link that is independent of the hardware, such as Compaq's, isn't sufficiently integrated with the hardware for nonstop reliability. Novell won't come down on either side of the issue.

"We expect the arguments to continue out there long after we ship SFT III," Young said.

For now, it would be enough just to get it out the door. "Users think of SFT III like a legend," said Jodi Mardesich, a San Francisco-based analyst with The Burton Group. "If Novell can actually make [SFT III] really reliable, they may be able to lure downsizers [to buy NetWare 4.0]." But the company has to ship it.

"We're going to get this thing out yet," Young said. "It's a very complex piece of technology." ◻

NetWare SFT III

The outlook on server mirroring

- **500 beta copies due in third quarter**
- **Final version due 6 months after NetWare 4.0 ships later this year**
- **Sold separately as NetWare add-on**
- **Compatible only with NetWare 4.X, although beta copies work with Version 3.11**

ABA plans for electronic payment

continued from page 1

ing partner agreements have become commonplace when buying and selling goods, such agreements have generally failed to address a newer area of EDI — electronic payments.

But just as users have come to rely on trading partner agreements to provide a framework of understanding when goods are sold using EDI, they also stand to benefit from an agreement that lays out common ground rules for how payments are exchanged.

Use of electronic funds payments in EDI is being spurred by the creation of the ANSI X.12 Committee's payment order/remittance advice transaction set, which was developed about a year ago. Transaction set No. 820 established a way for the order originator to ask a bank to transfer funds to the account of a beneficiary, such as a supplier. The set also contains an option for how remittance information about the transaction will be shared.

Remittance information in the No. 820 transaction set often contains detailed information deemed sensitive, such as patient medical data in the health insurance industry, Baum said.

Firms may want to stipulate in their agreements how they will transmit that remittance information — through the funds transfer system, a third-party service provider or over a private line between the trading partners.

"Unlike traditional EDI, where you assume [all the information is] being sent to your customer, the bank has now become a player in the system," Baum said. "So it may be useful to define what pieces of information you want to pass through the banking system."

The model electronic payments agreement covers simple topics, such as how soon one party should notify the other if a transaction set is received garbled, to more complex issues, such as defining the security procedures the firms will follow.

Parties can define data encryption and verification procedures, such as use of digital signatures. ◻

Vendor unveils TCP/IP pack

continued from page 2

Internet Protocol net, each polling locally attached devices and feeding data to a central management system. That obviates the need for the host to poll every SNMP agent and reduces network management traffic.

Other vendors such as Cabletron Systems, Inc. and SynOptics Communications, Inc. are also supporting a distributed polling feature for TCP/IP nets, according to Carl Vanderbeek, president of Automated Network Management. "But they are tightly coupled with their own management platforms," he said.

The new option will enable users to select which SNMP Management Information Base (MIB) objects to monitor and how often to poll them, Vanderbeek said.

With NAP's NetSet, an OS/2 Presentation Manager program, users can also create SNMP agents and MIBs for devices that do not have them. MIBs for Cisco Systems, Inc. bridge/routers, Cabletron hubs and Microsoft Corp. LAN Manager-based servers ship with NAP.

"For users who desire an independent SNMP management station capable of stand-alone management of TCP/IP networks via SNMP, a solution such as IBM's AIX NetView/6000 is better suited for them," he said. "[But] for the user that is either budget-constrained or is trying to eliminate multiple enterprise management systems in favor of a centralized management approach such as NetView, NAP SNMP may fit the bill."

The SNMP option is available to current NAP users for $1,000. A complete SNMP/NAP implementation sells for $15,000 and includes an IBM Personal System/2 Model 80, OS/2 Version 2.0, NetView/PC Version 1.2, IBM TCP/IP Version 1.2 and NAP Version 1.3. For AccuMaster users, NAP includes AT&T's vender alarm interface. ◻

Forwarding not only measure

continued from page 1

In addition, he said many users mistakenly equate packet-forwarding speed with aggregate throughput. Some bridge/routers that are labeled slow because they cannot forward 10,000 small packet/sec can actually perform as well as — and sometimes even better than — the presumed industry leaders in throughput.

"The only time you get the sexy 10K packet/sec numbers is when the vendor deliberately chooses artificially small frame sizes, like 28 or 32 bytes," Tolly said. "But if you choose to be realistic and forward larger frames — such as 250-byte frames that are indicative of [IBM] 3270 traffic — users will see the packet-per-second figure drop significantly."

Several internetworking vendors acknowledged privately that vendor-supplied performance statistics are not always on target. "It's typically the rule that vendors give out numbers [based on small packets] that are most favorable to their products but probably least favorable to users," one vendor said.

Scott Bradner, a senior technical consultant at Harvard University's Office of Information Technology, who also runs independent router performance tests for Interop, Inc., concurred. Vendor-supplied figures often do not take into account how the device will perform under adverse conditions, such as broadcast storms, or its ability to handle multiple protocols, he said.

> "Vendors give out numbers that are most favorable to their products."
>
> ▲▲▲

A good starting point to better gauge bridge/router performance is to inquire what packet size the vendor used to measure its product's forwarding rate.

Tolly said network managers must also understand the packet rates that common applications generate in order to match those application needs to throughput demands.

For example, a user running electronic mail or file transfer applications that have an average packet size of 500 bytes or more should judge a bridge/router's throughput performance based on the speed at which the bridge/router can forward that packet size. The closer the rate reaches wire speed — 10M bit/sec for Ethernet local-area networks and 4M or 16M bit/sec for token rings — the better its throughput.

Users must also take into account latency, which is how long it takes for a packet to enter and exit a bridge/router. The shorter the latency, the better the performance since the device runs a smaller risk of dropping packets.

Ideal latency is measured in microseconds, regardless of packet size or LAN media. "Ideally, you want to have an undetectable latency rate, where the packet traverses the bridge/router so fast that a sophisticated analyzer views it as being zero," Tolly said.

In the end, defining absolute packet rates on multiprotocol internets is nearly impossible, Tolly said. But it is feasible for the user to combine the three metrics and identify their common traffic patterns to determine performance requirements.

And even after a bridge/router's true performance is determined, users are left with the task of choosing a box on other grounds, such as its ease of configuration and management, its interoperability in multivendor nets, and the quality of the vendor's service and support offerings. But getting accurate performance metrics is a good first step in choosing the right internetworking gear. ◻

Bill proposes digital libraries

continued from page 2

Agency to field prototype digital libraries, which many universities and publishers see as important to their future (see graphic, page 50). "Son of NREN" calls attention to the need to sort out the complex problems of achieving a standardized method of database access and a billing mechanism for accessing published information.

As in his NREN bill, Gore's "son of NREN" reaches for the moon, asking that the digital libraries be "advanced storage systems capable of storing hundreds of trillions of bits of data and giving thousands of users nearly instantaneous access to that information."

The new bill also proposes Internet access for a new category of users — kindergarten through high school. Gore's legislation, which is backed by nine Senate cosponsors, allots $300 million to the NSF to ensure that elemen-

(continued on page 50)

Network World Advertising Sales Offices

BOSTON
Donna Pomponi, District Manager
Eleni Brisbois, Sales Assistant
161 Worcester Road, Framingham, MA 01701
(508) 875-6400/FAX: (508) 651-1853

NEW YORK/N. NEW JERSEY
Joan Daly, Eastern Regional Manager
Marlene Levis, Sales Assistant
365 W. Passaic St., Rochelle Park, NJ 07662
(201) 587-0090/FAX: (201) 712-9786

S. NEW JERSEY/PHILADELPHIA/D.C.
Jacqueline Mita, District Manager
Marlene Levis, Sales Assistant
365 W. Passaic St., Rochelle Park, NJ 07662
(215) 834-1390/FAX: (201) 712-9786

CHICAGO
Dan Gentile, District Manager
Kathy Mazzie, Sales Assistant
10400 West Higgins Rd., Suite 300
Rosemont, IL 60018
(708) 297-8855/FAX: (708) 827-9159

SAN FRANCISCO
Chris Curry, Western Regional Manager
Sandra Kupiec, District Manager
Lonnie Forbes, Sales Assistant
Beverly Davis, Sales Assistant
2083 Landings Drive, Mountain View, CA 94043
(415) 691-0510/FAX: (415) 691-0525

ATLANTA
Don Seay, District Manager
Beth Juren, Sales Assistant
1400 Lake Hearn Dr., Suite 330, Atlanta, GA 30319
(404) 394-7509/FAX: (404) 255-5123

LOS ANGELES
Richard Carlisle, District Manager
Karen Silverstein, Sales Assistant
18008 Sky Park Cir., Suite 145, Irvine, CA 92714
(714) 250-3006/FAX: (714) 250-4881

RESPONSE CARD DECKS/ACTIONCENTER/ NETWORKING MARKETPLACE
Joan Bayon Pinsky, Sales Director
Clare O'Brien, Acct Mgr, ActionCenter Response Cards
Shannon Summers, Account Executive, Marketplace
Eleni Brisbois, Sales Assistant
(508) 875-6400/FAX: (508) 651-1853

RECRUITMENT ADVERTISING
William Reinstein, National Sales Director
Pam Valentinas, Senior Account Manager
Christie Sears, Sales Assistant
(508) 875-6400

ADVERTISING OPERATIONS
Karen Wallace - Manager of Advertising Operations
Linda Miller - Senior Account Coordinator
Cathy McPherson - Advertising Coordinator
Barbara Hill - Classified Account Supervisor
(508) 875-6400

NETWORK WORLD, INC. - An IDG Company

161 Worcester Road, Framingham, MA 01701
(508) 875-6400/FAX: (508) 879-3167

Colin Ungaro - President/Publisher
Thomas J. Wilson - Vice President, Sales
Mary Fanning - Dir. of Financial Operations
Nanci Farquharson - Adm. Assistant

MARKETING
Evilee Thibeault - Vice President Marketing
Carol A. Leonard - Marketing Specialist/Events
Julianne Jeremiah - Mktg. Specialist/Promotion

RESEARCH
Ann MacKay - Research Manager

CIRCULATION
Richard Priante - Director of Circulation
Renee Visconti - Fulfillment Manager
Bobbie Cruse - Customer Service Rep.
Edna Clifford - Circulation Assistant

PRODUCTION
Ann Finn - Production Director
Cheryl Rothman - Senior Production Coordinator
Anne Rosenkranz - Imaging Manager
Terri Mitchell - Production Assistant
FAX: (508) 875-3090

REPRINTS
Donna Kirkey - Reprint Coor./Graphic Designer

LIST RENTAL SERVICES
Andrew Sambrook - List Rental Sales
P.O. Box 9151, Framingham, MA 01701-9151
(508) 879-0700

INFORMATION SERVICES
Jeff Pennett - Director of Info. Services
Jack McDonough - Manager of Info. Services

DISTRIBUTION
Bob Wescott - Distribution Manager
(508) 879-0700

IDG
Patrick J. McGovern - Board Chairman
Walter Boyd - President
William R. Murphy - Vice-President Finance
Robert Farmer - Vice Chairman

Network World is a publication of IDG, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. IDG publishes over 181 computer publications in more than 58 countries. Thirty million people read one or more IDG publications each month. Network World contributes to the IDG News Service offering the lastest on domestic and international computer news.

Calif. net aimed at deadbeats

continued from page 6

the U.S. Virgin Islands.

It will also connect the counties with databases used by other California state agencies, such as the Franchise Tax Board, the Department of Motor Vehicles and the Employment Development Department, thus simplifying the search for absent parents and their assets.

Because of its population and high number of child support delinquencies, Los Angeles County received a waiver from the federal government to create its own child support net, which Lockheed IMS is currently developing.

The new statewide net will use digital circuits provided by California's private network, dubbed CalNet, as its backbone.

Regional data centers in 10 to 12 counties will be linked to the main data center here and to sites in surrounding counties via 56K bit/sec lines.

"It will be in the form of what we are calling a distributed star," said Kris Warren, technical manager of the project for Lockheed IMS. "There aren't home runs back to Sacramento from every county, but there will be from the counties acting as hubs."

Expected to be implemented before the federally mandated date of Oct. 1, 1995, the net will comprise two network monitoring points. Lockheed IMS is setting up one management point at the main data center here and will use DEC's DEC Management Control Center Director.

Pacific Bell will set up a second net monitoring facility from which it will proactively diagnose and address problems before end users are aware of them, according to Erwin Furukawa, district account manager for Pacific Bell.

The U.S. government has officially approved California's plan to meet the federal requirements and will pick up more than 75% of the contract's estimated $75.5 million price tag. The state's share will be $17.4 million.

According to John Healy, interim director of California's DSS, the network is expected to generate more than $11 million each month in child support payments, which will not only provide needed assistance to children in California, but also help the net to pay for itself. ◘

Legent signs on to SystemView

continued from page 6

"The goal for SystemView products is to gather the systems management products, make sure they interoperate and let users choose the best of breed," said Bob Yellin, senior vice-president of development for Legent. "We are now beginning to lay the framework for products that will interoperate in the future."

Users, however, weren't overwhelmed by the announcement.

"Whether or not a product is SystemView-compliant doesn't mean that much to us," said Herbert Yarbrough, senior information systems analyst in the information technology architectures division of the Duke Power Co. in Charlotte, N.C. "We'll buy the products that get the job done."

Yarbrough said his company is currently selecting products to manage its distributed environment, which includes IBM's LAN Server, Novell, Inc.'s NetWare and Digital Equipment Corp.'s Pathworks products.

"We hope that Legent's involvement with SystemView will push the development of systems management products," Yarbrough said. "It would be nice, for example, if IBM and Legent could come up with a database that worked with both of their systems management products."

Analysts said such developments may be a ways off.

"Users won't see immediate results, but the IBM-Legent agreement is for long-term research and development evolution of products," said Arnold Farber, president of Farber/LaChance, Inc., a consultancy in Richmond, Va.

Whether the two companies can work successfully together is another question, analysts said. Legent has been conspicuously absent from SystemView activity in the past, while other large third-party systems management vendors, such as Candle Corp. and Goal Systems International, Inc., pledged their support.

> "Whether or not a product is SystemView-compliant doesn't mean that much to us."
>
> ▲▲▲

Many analysts said that Legent began to see the SystemView light in April when it acquired Goal Systems, a mainframe automation software vendor.

"It's another one of IBM's grand unification endeavors that'll be good for Legent because it makes them [equal] partners with IBM," said Peter Burris, director of commercial systems research at International Data Corp. in Framingham, Mass. ◘

The Information Infrastructure and Technology Act of 1992

Authorizations by area and agency in millions of dollars

Agency	1993	1994	1995	1996	1997	Total
National Science Foundation Education	$20	$40	$60	$80	$100	$300
Digital libraries	$10	$20	$30	$40	$50	$150
National Institute of Standards and Technology	$30	$40	$50	$60	$70	$250
National Institutes of Health	$20	$40	$60	$80	$100	$300
NASA	$10	$20	$30	$40	$50	$150

GRAPHIC BY SUSAN SLATER

SOURCE: SEN. ALBERT GORE (D-TENN.), WASHINGTON, D.C.

Bill proposes digital libraries

continued from page 49

tary and secondary schools receive a network connection to the Internet, or the NREN if that proposed gigabit-speed network can be built in five years.

The bill would also give the National Institutes of Health and the National Library of Medicine funds to develop medical-imaging test bed networks and encourage the development of visualization software for analyzing X-rays and CAT scans.

Giving some leeway

But in many instances, "son of NREN" is less detailed.

For example, it calls for an Advanced Manufacturing Systems and Networking Project, a collaborative government-industry effort intended to "develop, refine, test and transfer advanced computer-integrated electronically networked manufacturing technologies and applications" but offers no further details on the plan.

Senate sources said the bill is deliberately vague in order to give agencies leeway in executing the bill's ideas.

But some feel it is ambiguous because Senate Democrats felt it would stand a better chance of passing without too many details to which the Bush administration might object.

Senate sources concede the bill will likely undergo revisions once hearings are held, which could be before the August congressional break.

Rep. George Brown (D-Calif.) may introduce a companion bill in the House within the next month.

Mike Roberts, vice-president of networking at Educom, a nonprofit education-interest group based here, said his organization is pleased with the bill, noting it is the first time federal legislation has undertaken to ensure that elementary and secondary schools receive Internet funding.

"It will be interesting to see if the administration will go along with that," Roberts said, adding that President Bush has been strongly voicing support for education.

He also applauded the bill's focus on digital libraries. "There has to be a digital library system, and we have to put some resources into it," he said. "We're at a very primitive state in the storing, search and transfer of images in bibliographic form." ◘

NETWORK WORLD

▲▲▲

161 Worcester Road
Framingham, Mass. 01701-9172
(508) 875-6400

Second-class postage paid at Framingham, Mass., and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-820-7444.

Non-qualified subscribers: $5.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. and Canada to qualified management or professionals who specify and maintain communications equipment, including voice, data and video, as well as to common carriers, consultants, systems houses and manufacturers of communications equipment.

PHOTOCOPY RIGHTS: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by Network World, Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus 50 cents per page is paid to Copyright Clearance Center, 27 Congress Street, Salem, Mass. 01970.

POSTMASTER: Send Change of Address to *Network World*, P.O. Box 3090, Northbrook, IL 60065.

Copyright 1991 by Network World, Inc. All rights reserved. Reproduction of material appearing in *Network World* is forbidden without written permission.

BPA

Reprints (minimum 500 copies) and permission to reprint may be purchased from Donna Kirkey, Network World, Inc., 161 Worcester Road, Framingham, Mass. 01701-9172.
ISSN number: 0887-7661.

Network Innovators

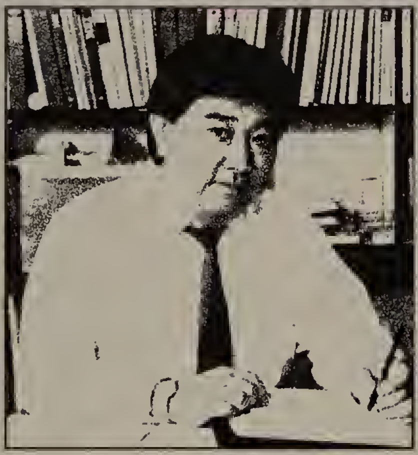
John Nagata

Nagata conquered budgetary and bureaucratic restraints to build a network linking L.A.'s schools.

by Lucie Juneau

It takes a rare mix of skills to usher a financially strapped, bureaucracy-bound organization such as the Los Angeles Unified School District into the information age.

As it turns out, John Nagata, assistant superintendent of information technology for the school district, had the right stuff.



Included among Nagata's qualifications: a teacher's gift for communicating and persuading, an insider's understanding and emotional investment in the Los Angeles schools, technical networking know-how and the determination to pursue his goals, despite severe budgetary shackles and a bureaucracy as thick as molasses.

With his varied background, Nagata was able to pull off a small miracle by linking more than 800 Los Angeles schools and facilities on a shoestring budget. The network that links the nation's second-largest school system provides a backbone for a variety of administrative applications that serve the system's more than 60,000 employees and 800,000 students.

For his efforts, Nagata last year received an honorable mention in the Awards for Achievement in Managing Information Technology, cosponsored by Carnegie-Mellon University's Graduate School of Industrial Administration in Pittsburgh and American Management Systems, Inc. in Arlington, Va. He was recognized for taking a leadership role in managing information technology and making a significant impact on his organization and profession.

The award program's judges described him as "a risk taker with the dedication and vision to put technology to strategic use."

And that he has done.

In the late 1980s, Nagata petitioned the school board for a $32 million budget to rebuild an archaic student records system and erect a network linking all of the district's schools. Instead, he received only $7 million. Nevertheless, Nagata and his team completed the student records system and established a net connecting the district's 400 elementary schools.

The net construction might have halted there if the teachers' union hadn't lobbied the district to implement a computerized payroll time-reporting system. It was designed to replace a manual time card system the district had been using for many years.

On Wednesdays, the schools would submit teachers' time cards, including a guesstimate of their hours worked through that Friday. Then data entry personnel would enter the information — sometimes erroneously — via a keypunch system.

A pilot time-reporting system, designed by Nagata's office and linked to an IBM DB2 database, has been in place for three years. The result has been more accurate time-reporting records that can be used to evaluate teacher attendance patterns.

To introduce the new system into the schools, Nagata drafted project managers from school personnel who had worked with the old paper-based system. "Most school districts do it the other way around," he says. But he believed putting control in end users' hands would ensure that user needs were addressed as well as get them to buy into the new system.

Nagata's staff expanded the district's network to implement the time-reporting system, which required providing all the schools in the district with access to the administrative offices. To do this, they constructed a six-node T-1 backbone net connected to an IBM 3745 front-end processor at the data center, which provides access to seven IBM mainframes and two Unisys Corp. Liberty 400 hosts.

About half the schools access the backbone via dial-up lines, while the other half are linked via dedicated 56K bit/sec Advanced Digital Network (ADN) lines from Pacific Bell. Eventually, all the schools will use ADN lines for network access, Nagata says.

Nagata believed putting control in end users' hands would ensure that user needs were addressed.

■

Two workers use a customized version of IBM's NetView to monitor the entire network from a central communications office, a vast improvement from the previous setup. "In the past, we needed 25 people to find out if a modem or line was bad," he says.

Nagata now oversees the use and maintenance of seven IBM mainframes, two Unisys hosts, 400 Network Equipment Technologies, Inc. IDNX multiplexers, 22,000 Apple Computer, Inc. microcomputers and about 150,000 personal computers.

Although performing in-house maintenance on such a large and diverse amount of equipment can be a major headache, Nagata claims it is well worth the effort.

"I bet we save $14 million a year by repairing our own computers," he says. He estimates that his 30 repair personnel can maintain the district's 22,000 Macintosh computers for an entire year for the same price as contracting out those services for a month.

Even so, before the Los Angeles school board would authorize Nagata's office to handle maintenance in-house, he had to persuade them his group was up to the task. To allay the board's fears, he vowed to provide a one-day turnaround on all repair and maintenance calls. Today, Nagata's staff still provides a one- to three-day turnaround on service requests.

In addition to maintaining the district's computer and telecommunications equipment, his approximately 300 staffers develop applications, design systems, run a user hot line and control the network.

Nagata purchased most of the network equipment through IBM. Typically, firms of IBM's size and stature cannot be as competitive as smaller companies, but Nagata has a way of getting good deals out of vendors, says Gracie Jones, a member of Nagata's staff and administrator of the Los Angeles Unified School District's information technology division.

"He's not confrontational, but [when] negotiating with vendors, he is a risk taker in terms of pushing as far as he can to see how much he can get," she says. Some of the network's data channel units were installed at no cost, and some systems software was written for free, based on partnerships he has established with vendors.

"He's not confrontational, but [when] negotiating with vendors, he is a risk taker in terms of pushing as far as he can to see how much he can get."

■

Nagata says the district's size gives him purchasing clout and room to negotiate. "We can use that to our advantage," he says.

Nagata's latest assignment is to integrate the district's financial software systems, which will be used to manage the school system's finances. A budget of $23 million has been set aside for the project, which will place authority for managing school budgets with the individual schools rather than the central administration, Nagata says. "We will be bringing an additional 6,000 users — including accountants, teacher coordinators and secretaries — onto the mainframe," he says.

"We are excited about the financial system because it will help principals bypass the bureaucracy," Nagata adds. "They'll have what they need right on-line."

Occasionally, Nagata himself gets frustrated by the school system's bureaucratic pace, Jones says. But so far, he seems to be demonstrating a knack for navigating roadblocks. Perhaps it's because the educational community, for the most part, is on his side. Colleagues credit Nagata's focus on user needs and a consensus-building managerial style.

Nagata has a different explanation. "The network has a lot to do with it," he says. "The teachers want to talk to everybody from here to [the East Coast] one day."

Juneau is a free-lance writer based in Salem, Mass.

Network tall buildings in a single bound.

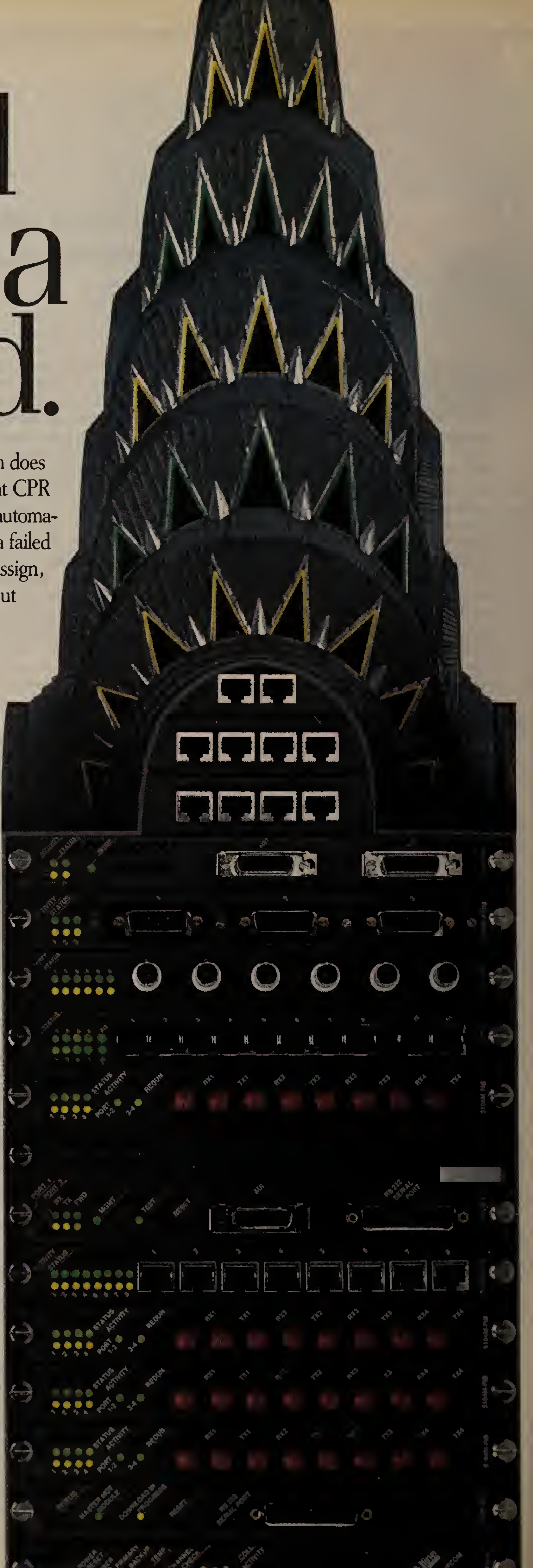
With Chipcom's ONline™ System Concentrator you can connect a tall building or a far-flung campus with a seamless, unified and totally reliable network. A network that is truly self-healing, and capable of surviving multiple faults, from broken cable to failed modules or power supplies.

The ONline Concentrator is an intelligent wiring hub that handles all media, including coax, fiber and twisted pair. Its TriChannel™ architecture lets you configure up to three networks on each hub in any combination of Ethernet, Token Ring and FDDI.

Other network management systems merely allow you to perform an autopsy after your network has died. Chipcom's new Network Control System does much more: It provides instant CPR to keep your network alive by automatically rerouting itself around a failed component. And it lets you reassign, balance and reconfigure without setting foot in a wiring closet.

Using Chipcom's ONline System Concentrator as your network platform, you can build a network with the reliability, flexibility and manageability necessary to take it into the 21st Century.

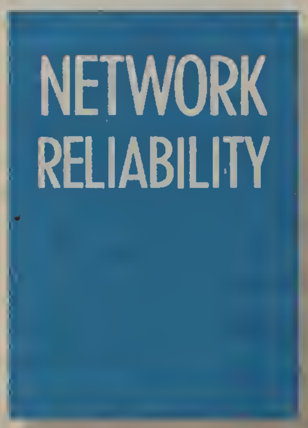
And just think what a super hero that will make you.



BECOME A HERO.

Learn how to conquer the major causes of network failures. For your free copy call 1-800-228-9930.

GSA# GSOOK90AGS5185



CHIPCOM™

ONline and TriChannel are trademarks of Chipcom Corporation.

© 1991 Chipcom Corporation, Southborough Office Park, 118 Turnpike Road, Southborough, MA 01772

Circle Reader Service #110